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THE

GARDENS' BULLETIN

SINGAPORE

Vol. XVII, Part III 18th May, 1960

CONTENTS

	Page
SANTAPAU, H.: I. H. BURKILL in India	341
FURTADO, C. X. and R. E. HOLTTUM: I. H. BURKILL in Malaya	350
VAN STEENIS, C. G. G. J.: Phellodendron, a genus of trees new to the Malayan flora (Rutaceae)	357
HOLTTUM, R. E.: Vegetative characters distinguishing the various groups of ferns included in Dryopteris of Christensen's Index Filicum, and other ferns of similar habit and sori	361
CORNER, E. J. H.: Taxonomic Notes on Ficus Linn., Asia and Australasia. Sections 1–4	368
Editor.: Posthumous Publication of New Dipterocarp Species from North Borneo	486
B. E. S.: G. H. S. WOOD, M.A., F.L.S. (A tribute)	498

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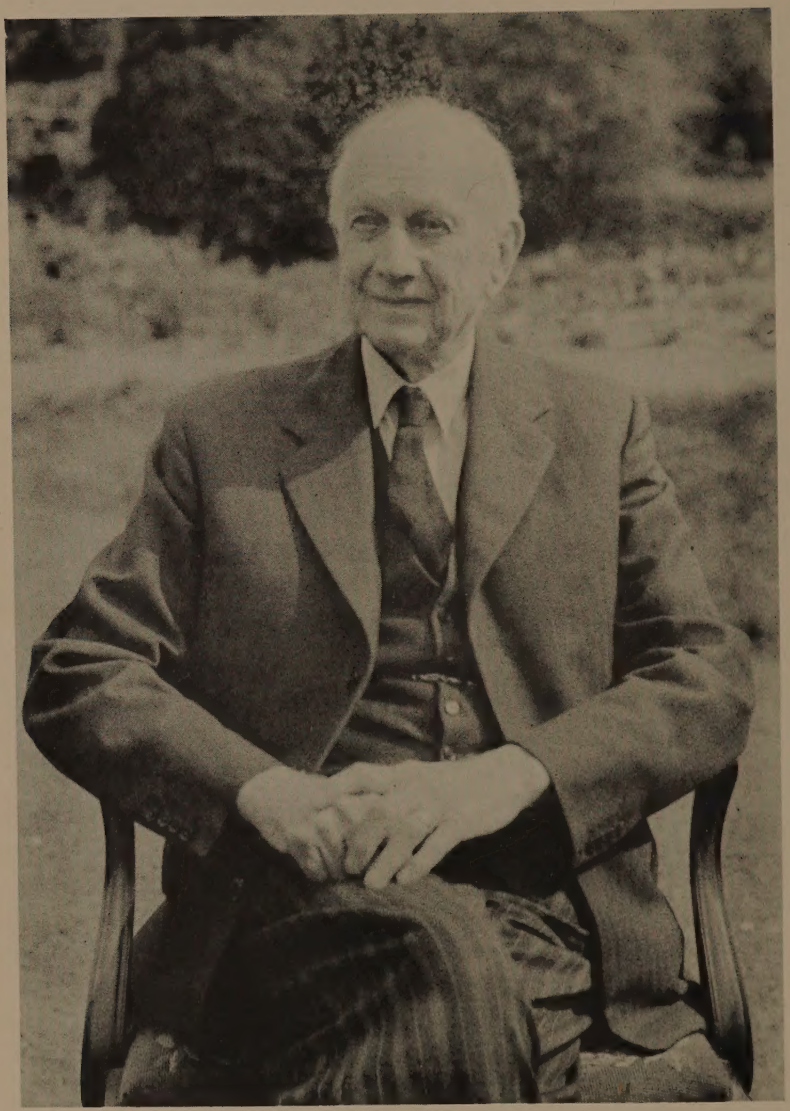

I. H. BURKILL, M.A., F.L.S.
Born 18th May, 1870

This photograph was taken in the garden of his home in England early in his 90th year

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Vol. XVII, Part III Issued 18th May, 1960

I. H. Burkill in India

H. SANTAPAU, S.J., F.N.I.

FOR MANY YEARS I had been familiar with I. H. Burkill and the splendid work he had done during his time in India as an officer of the Botanical Survey of India; it was my privilege during an extended visit to Kew Herbarium in 1946–1948 to come to know him personally, and this almost daily contact deepened in me the esteem that I had conceived from the perusal of his writings.

It is not an easy matter to give in short a sketch of the Burkill I came to know and respect. In my opinion, and this seems to be the common opinion of those who know him well, I. H. Burkill is a charming gentleman of the good old school, always courteous and obliging, ever ready to extend a helping hand to an honest struggling botanist. In his work Burkill is one of the most meticulous and accurate botanists that it has been my fortune to meet in my life; in his papers and books every item is checked properly, every minutest and most insignificant detail is tested. Such accuracy at times might appear almost a waste of energy; but research workers are grateful that he has had the patience to delve into such minute details. As an example of his care, one of the first examples that came to my notice in Kew Herbarium, I might cite but one case. Burkill found that one of the Compositae of South America was known under the Spanish-American name of "Coronilla de oro" (meaning "The Little Golden Crown"); to Burkill it was not enough to find out what the particular plant was, but he did his best to ascertain why precisely such a plant was called by this name.

One of the reasons why he has been so accurate in his writings is that he has spent a long life carefully taking down notes on any point that at a later date might prove of interest. In a private letter of Nov. 27th, 1951, he tells me, for instance: "Someone, I forget who it was, put into print a statement that I was writing up a history of botany in India. That was not exactly true; but I was collecting material that would help towards a history . . . This collecting began when I was arranging the collectors in Prain's and my volume of Dioscoreas; and the data went into slips . . ."

This thoroughness, in fact, explains the extraordinary amount of information that one can derive from all Burkill's books and papers, even those written during his early years in Kew and India.

Biographical Data

I. H. Burkill was born on May 18th, 1870, near Leeds, Yorkshire in England; he was trained in Cambridge, where he graduated with B.A. Hons. in Natural Science from Caius College; I have no details of his university career, except that he obtained the Frank Smart Prize as a result of the performance at his final examination. Shortly after his graduation, he was appointed Assistant Curator, University Herbarium, Cambridge, a post that he held from 1891 to 1896; during that time he obtained his M.A. from Cambridge University. From 1897 to 1899 he was on the staff of the Royal Botanic Gardens, Kew, as Assistant in the Herbarium; from 1899 to 1900 he was Principal Assistant in the same Royal Botanic Gardens.

Burkill's service in India began in 1901, when on the recommendation of the authorities of the Royal Botanic Gardens, Kew, he was appointed Assistant Reporter on Economic Products to the Government of India, and was posted to the Indian Museum, Calcutta, under George Watt as the Reporter. Throughout his career in India, Burkill continued attached to the same office; in 1902 he was Officiating Reporter under Sir G. Watt; in 1907 he was still mentioned as Officiating Reporter, although Sir G. Watt had already retired. The Report of the Botanical Survey of India for the years 1911–1912 says: "The Director was absent on privilege leave from 21st April to 2nd July 1911, during which time Mr. I. H. Burkill officiated in addition to his substantive duties as Economic Botanist of the Botanical Survey of India. Up to 31st January 1912 Mr. Burkill was Assistant Reporter on Economic Products officiating as Reporter, and thereafter on the abolition of the Reportership became Economic Botanist to the Botanical

Survey, which post he held for the remainder of the year." This would seem to indicate that Burkill was Officiating Reporter from 1902 to 1912, although in some official reports he is put down as the Reporter from about 1908 onwards.

In the introduction to *The Botany of the Abor Expedition* Burkill himself writes: "It fell to me, in the middle of the Hot Weather of 1911, when *acting as Director of the Botanical Survey of India,* during the leave of Colonel A. T. Gage, to propose to the Government of India that a botanist should be told off to accompany the Abor Expedition; and to my gratification, after Colonel Gage's return, I was sent." (Italics my own).

When in 1954 I informed Burkill of my appointment as Chief Botanist to the Government of India, a new designation for the post of Director, Botanical Survey of India, he wrote and gave a number of details of the Calcutta he had known in his younger days; one interesting detail, for instance, is the following: "Opposite to you in St. Xavier's College is (or was) no. 47 Park Street in which I lived from 1901 to about 1909. The house belonged to the Nawab of Murshedabad and the old Nawab did not need a house in Calcutta; so some 5 of us chummed there. I used to hear sometimes the austerity call at 4.30 a.m. which woke St. Xavier's household . . ."

Burkill's Botanical Collecting Tours

During his time in the Indian Museum, Calcutta, as Officiating Reporter or as Reporter on Economic Products, Burkill spent much energy collecting information either in the field or through correspondents on important economic products of India. From various hints given by Burkill in his papers, I have been able to deduce the dates of some of his major collecting expeditions. Unfortunately due to pressure of work, I have not been able to go through the publications of the Botanical Survey of India in detail; I leave it to a future occasion to prepare a detailed list of all Burkill's exploration tours in India, as reported in the official documents of the Calcutta Garden and Museum.

The Sikkim Expedition of 1906. "Mr. Burkill . . . paid an autumn visit to Phallut in 1906 in search of Aconite tubers" (Kew Bull. 1907: 175). Burkill himself writes from Calcutta on October 15th, 1906: "I found my second trip to Phallut interesting and agreeable . . ." What the first trip was, I cannot tell with the information at my disposal. In the same account Burkill writes: "I amused myself by the wayside making flower pollination notes and am

now writing up a short paper . . ." Several papers, in fact, were published by Burkill on the subject, and this would indicate that he had made detailed excursions to many parts of India. His published notes on flower pollination concern flowers of the following areas: Bengal and Assam, North-West Himalayas, Simla Hills, Central Provinces and Berar, etc.

Journey into Nepal, 1907. An account of this trip is given by Burkill in *Rec. Bot. Surv. India* 4 (4): 59–140, 1910. The first paragraphs of the account state: "On November 28th, 1907, after marching along nearly one hundred miles of the Nepalese frontier between Jainagar and Raksal, I turned, with the permission of the Nepalese Darbar, into the kingdom of Nepal and reached Khatmandu by the usual route on December the second. Thence . . . I visited the Trisuli valley, in the neighbourhood of Naikot. I returned from Nepal to the plains by a route through Pherphing, which diversifies the first seventeen miles of the way. My dates almost coincide seasonally with the dates of Wallich's march to Khatmandu, and we seem, he and I, to have gathered at a period 87 years apart the same plants in the same spots . . . It is ill gleaning for novelties after a botanist with the keenness of Wallich; so I got no more than three species of *Impatiens* and apparently one of *Eriocaulon* . . ."

The *Notes from a Journey to Nepal,* based on the observations made in just a fortnight, cannot and do not claim to give an account of the flora of Nepal; "what is written . . . is, indeed, but a superficial account of the features of the vegetation between Raksal and the Himalaya of Central Nepal as far back as 35 miles in a straight line from the skirts of the plains and not higher than 7,0000 ft. There was but one excuse for writing it, i.e., the great want of knowledge of the Botany of that part of the chain." This account has always been of particular interest to me personally, and lately this interest has been enhanced by the fact that one of my students has been doing research for several years in an area of Nepal that includes the whole part visited by Burkill and previously by Wallich. Burkill in his *Notes* lists about 400 genera of plants collected in his short trip, and this, to say the least, is by no means a negligible result.

The Botany of the Abor Expedition. As stated above, it was at Burkill's suggestion that a botanist was assigned to the expeditionary force that went into the Abor Hills; it was certainly lucky for us, his successors, that Burkill was selected for the job. His account is one of the most carefully complete papers that have been published for any botanical expedition of the last two hundred

years in India with the exception of Hooker's Himalayan journeys. Burkill and his two collectors remained attached to the expeditionary force from November 29th, 1911, till March 11th, 1912.

The methods of work followed by Burkill during this trip were determined by the type of terrain and by the fact that for the safety of the botanists they had to betake themselves to one of the camps before nightfall. "The plants low in the natural system of classification could be of little use to me in my particular object, because their geographic distribution is yet so little known. I collected them as I was able . . . Material of tall trees was collected by the aid of a shot gun. An anaeroid barometer and a camera went with me everywhere; and for a time I had wet and dry bulb thermometers in camp, though to little good effect . . . To obtain as many plants in flower as possible, I moved backwards and forwards along the line, and I stationed my experienced collector about two marches behind me, that I might have a pair of eyes on the watch for that which had not been in flower when I passed. Having a collector behind me gave another advantage, for thereby there was an economy in transport, as it was easy to send to him down the line by the food supply coolies half-dried plants for finishing; but the carrying up the line of full supplies of drying paper over two marches that could be avoided, was a consideration. It was at all times necessary to keep the weight of the collections down, and under these circumstances my Diary was made to serve as much as possible. It became a record of 8,000 observations supplementing the notes with the specimens." Much living material was sent directly from the field to Calcutta and thence to Darjeeling; dried plants were also sent, when ready, to Calcutta, where Col. Gage placed them in the hands of assistants for a preliminary examination. The final study of the materials collected by Burkill on this occasion was only made prior to the publication of the report in 1924. The *Botany of the Abor Expedition* is an excellent account, a model of how such expeditions should be organised, collecting done and materials studied; the presentation of the results is remarkable for conciseness and completeness.

Chapters on the History of Botany in India. Although this work has only been published recently, long after the retirement of Mr. Burkill from India, it forms, as it were, the crown of the work that Burkill has done for Indian botany. In November 23rd, 1951, I wrote to Burkill from Bombay: "Next August we are celebrating the publication of the 50th volume of our Journal of the Bombay Natural History Society. At a recent meeting of the Committee

I was requested to ask you for a contribution for the August number of the journal. The subject mentioned was a sort of Biographical Index of "Indian" botanists, i.e., of British and foreign botanists that have worked in India from the beginning of the XIXth Century onwards . . . As for the length of the Index, no limit has been set . . ." Burkill's answer was generous in the extreme: "You shall have all that I can give you" (27th Nov. 1951). "I propose to separate from my slip index all the names of botanists in India which belong to those deserving of mention in the proposed account of Botany in India 1800 forward. When I have done that I will see if I can find time to write an account and I will communicate with you." (16th Dec. 1951). On Sept. 18, 1952, he writes again: "I assure you most appropriately the work I am doing on the history of Indian Botany is absorbing my energies . . . My undertaking is larger than I expected; but I am getting on with it." Finally on March 25th, 1953, he could write that the MS of the first chapter had been posted to Bombay. Later on when asking about chapter 2, I received the following answer: "I shall get down to part 2 as soon as I can. At the moment I am entwined by African Dioscoreas. When last year something went wrong with my inside-machinery and I could not get over to Kew or to the libraries in London, I lost way. But I am able to get about again —at any rate I get over to Kew; and I am in better fettle on the eve of 84 than I was on the eve of 83." Chapter 2 was finally ready for the press in August 1956. At that time I wrote to Burkill: "From all over India and beyond I have heard great appreciation of your first chapter, with requests that when the series is over, it may be published in book form." Lately, at the beginning of this year, 1960, I had a letter from Burkill's son, Mr. H. M. Burkill of Singapore, in which the son writes: "I would like to add that I arrived back here from a visit to England but 4 days ago, and I left my father in good health. He was busily engaged in typing the final text of Chapter 3 of his History of Botany in India."

Burkill and Dioscorea. Burkill's publications, as may be seen from the list appended to this short paper, deal mainly with economic products; only a few give accounts of botanical trips in India. The genus Dioscorea has always held a special attraction for him; the yams have been known in India for centuries as important food plants; it is only natural that the Reporter on Economic Products would sooner or later devote his attention to Dioscorea. His first paper on the subject was published in Calcutta in 1904; later on he became associated with Colonel, later Sir, David Prain in a revision of the Asiatic species of this important

genus; several papers were published jointly with Prain. The crowning glory of the Dioscorea work is *An Account of the Genus Dioscorea* published in four large volumes in the Annals of the Royal Botanic Gardens, Calcutta in 1936 and 1938. Burkill today stands out as the greatest authority on the Dioscorea family; this is why he has been chosen to write on the Dioscoreaceae for the *Flora Malesiana;* he is now engaged in the last stages of the preparation of an account of the Dioscoreas of Africa and Madagascar.

Conclusion

Burkill was appointed Director of the Botanic Gardens, Singapore, on 10th September, 1912; he left Calcutta on leave in the middle of April, 1912; his Indian service was officially terminated at the end of his leave on the 16th October, 1912.

On the occasion of his 90th birthday, we, Indian botanists, wish to associate ourselves with gratitude to the homage that the Singapore Botanic Gardens are preparing for this happy day. May his life and bright intellectual powers be spared for many more years to come, so that he may continue to shed his light over the world and be an example to us all.

Appendix

Some of Burkill's Publications on Indian Botany

1904. A note upon the use of *Marsdenia* in the Rajmahal Hills. *Agric. Ledg.* 8: 113–114, 1904.

Manihot utilissima.—The Tapioca Plant: its history, cultivation and uses. A review of existing information. *Ibid.* 10: 123–148, illust. 1904.

Bixa orellana.—The Annatto-dye plant. *Ibid* 12: 177–187, 1904.

On *Dioscorea deltoidea,* Wall., *Dioscorea quinqueloba,* Thunb., and their allies. *Journ. Asiat. Soc. Bengal* n.s. 73 (II): Suppl. 1–11, 1904.

1906. A parasite upon a parasite,—A *Viscum* apparently *V. articulatum,* Burm., on *Loranthus vestitus,* Wall., on *Quercus incana,* Roxb. *Journ. & Proc. Asiat. Soc. Bengal,* n.s. 2: 299–302, 1906.

Gentianacearum Species Asiaticas novas descripsit I. H. Burkill sequentes. *Ibid.* 2: 309–327, 1906.

On *Swertia angustifolia,* Ham., and its Allies. *Ibid.* 2: 363–381, 1906.

Notes on the pollination of flowers in India.

Note No. 1. The pollination of *Thunbergia grandiflora,* Roxb., in Calcutta. *Ibid.* 2: 511–514. ff. 1–3, 1906.

Note No. 2. The pollination of *Corchorus* in Bengal and Assam. *Ibid.* 2: 515–520, 1906.

Note No. 3. The mechanism of six flowers of the North-West Himalaya. *Ibid.* 2: 521–525, t. 1, 1960.

Gossypium obtusifolium, Roxburgh. *Mem. Agric. Dept. India* (Bot. ser.) 1 (4): 1–10, t. 1, 1906.

Psophocarpus tetragonolobus. (Goa Bean).—Goa beans in India. *Agric. Ledg.* 4: 51–64, 1906.

1907. Notes on the pollination of flowers in India.

Note No. 4. On cotton in Behar. *Journ. & Proc. Asiat. Soc. Bengal,* n.s. 3: 517–526, 1907.

Alpine notes from Sikkim. *Kew Bull.* 1907: 92–94.

On *Gentiana coronata,* Royle. *Journ. & Proc. Asiat. Soc. Bengal.* n.s. 3: 149–168, ff. 1–9, 1907.

Anguilicarpus—a new genus of the Cruciferae. *Ibid.* 3: 559–561, ff. 1–6, 1907.

A note on *Impatiens balsamina,* Linn., as a dye-plant. *Ibid.* 3: 565–566, 1907.

1908. Notes on the pollination of flowers in India.

Note No. 5. Some autumn observations in the Sikkim Himalayas. *Ibid.* 4: 179–195, ff. 1–8, 1908.

Note No. 6. The Spring flora in the Simla Hills. *Ibid.* 4: 197–231, ff. 1–16, 1908.

1909. *A Working List of the Flowering Plants of Baluchistan,* Calcutta.

On Coptis. *Journ. & Proc. Asiat. Soc. Bengal* n.s. 5: 73–88, ff. 1–20, 1909.

First notes on *Cymbopogon Martini,* Stapf. *Ibid.* 5: 89–93, ff. 1–6, 1909.

1910. Notes on the pollination of flowers in India.

Note No. 7. A few observations made in the Central Provinces and Behar. *Ibid.* 6: 101–107, ff. 1–3, 1910.

Notes from a journey to Nepal. *Rec. Bot. Surv. India* 4: map, 59–140, 1910.

1911. The polarity of the bulbils of *Dioscorea bulbifera,* Linn. *Journ. & Proc. Asiat. Soc. Bengal* n.s. 7: 467–469, ff. 1–2, 1911.

Literature on the races of Rice in India. Compiled in the Office of the Reporter on Economic Products to the Government of India. *Agric. Ledg.* 16: 1–594, 1911.

Determination of the Prickly Pears now wild in India. *Rec. Bot. Surv. India* 4: 287–322, map, 1911.

1916. Notes on the Pollination of flowers in India.

Note No. 8. Miscellanea. *Journ. & Proc. Asiat. Soc. Bengal* n.s. 12: 239–265, ff. 1–10, 1916.

1924. The Botany of the Abor Expedition. *Rec. Bot. Surv. India* 10: 1–154, 1924; 155–420, tt. 1–10, 1925.

1954. Chapters on the History of Botany in India. I. From the beginning to the middle of Wallich's service. *Journ. Bombay Nat. Hist. Soc.* 51: 846–878, 1954.

1956. Chapters . . . II. The Advances, and in particular the plant collecting, of the thirties and forties of the 19th century. *Ibid.* 54: 42–86, 1956.

Burkill, I. H. & R. S. Finlow

1907. The Races of Jute. *Agric. Ledg.* 6: 41–137, f. 1, 1907.

On three varieties of *Corchorus capsularis,* Linn. which are eaten. *Journ. & Proc. Asiat. Soc. Bengal.* n.s. 3: 633–638, ff. 1–7, 1907.

1911. *Corchorus capsularis* var. *oocarpus*—a new variety of the common jute plant. *Ibid.* 7: 465–466, ff. 1–2, 1911.

Burkill, I. H. & D. Prain

1908. Dioscorearum novarum descriptiones quaedam. *Ibid.* 4: 447–457, 1908.

1914. A synopsis of the Dioscoreas of the Old World, Africa excluded, with descriptions of new species and varieties. *Ibid.* 10: 5–41, 1914.

1919. Dioscorea sativa. *Kew Bull.* 1919: 339–375.

1926. Ad Dioscorearum orientalium Historias commentarii. *Kew Bull.* 1926: 118–120.

1936. An Account of the genus Dioscorea. *Ann. Roy. Bot. Gard. Calcutta* 14: 1–528, tt. 1–150, 1936 & 1938.

I. H. Burkill in Malaya

C. X. Furtado and R. E. Holttum

Only a few years ago there was discussed in the *Gardens' Bulletin* the extensive pioneer work done by the late Mr. H. N. Ridley not only in showing that *Hevea brasiliensis* could be grown in Asia for the commercial production of rubber but also in laying stable foundations for the development of the several scientific departments for investigating the problems connected with fauna, flora, agriculture and forestry of Malaya. In view of this great work by Mr. Ridley, it might seem that his successor, Mr. Isaac Henry Burkill, would have little to do but follow on established lines. However, though we may not be able to do full justice to the subject, there are weighty reasons to consider the work of Mr. Burkill quite unique in its way; and it was work carried out, like Ridley's under many difficulties.

When Ridley retired from the service in 1912 and even before Burkill took the charge of the Gardens Department, the different departments which Ridley had helped to found, dissociated their connection with the Gardens' Department in order to work entirely as independent units in Malaya. Then the World War I (1914–1918) rendered impossible the execution of several projects because of the difficulties of recruiting properly trained staff, also because of lack of funds. Further, though the agricultural and the forestry departments were mainly for the Malay States, they had jurisdiction over the agricultural and forestry sections in the Straits Settlements, while the authority of the Gardens' Department was restricted to the official gardens within the Straits Settlements, so that the Gardens in the Malay States were placed under the Malayan Agricultural Departments. Difficulties in the Straits Settlements were mounting not only owing to lack of staff and finance but also to lack of appreciation of the value of purely botanical work; and perhaps this is the main reason why, soon after World War I, the area in which the arboretum was established and a good deal of acclimatisation work was being done on fruit trees and other economic plants and where rubber industry was born was taken away from the Gardens Department in order to establish Raffles College—the precursor of the University of Malaya, Faculties of Arts and Science.

But Burkill came here with an experience in India, where at the time, because of the limited availability of trained staff, one had to use one's skill to make a scientific undertaking a success. A rapid survey must have shown to Burkill that, if the Gardens' Department was to survive, it must become a centre for research of systematic botany; and for this purpose the first thing needed was to re-organise the whole herbarium and library so as to become less dependent on the workers and herbaria in India and England. Hitherto Ridley had worked in co-operation with the different specialists in India, England, Italy and Germany. The correspondence and his visits to Europe had helped him to describe his many new species and genera and write several papers. This extensive work had not given him time to organise adequately the herbarium and the library in Singapore; and perhaps because of the danger of termites and other vermin important specimens or types were sent to the workers in Kew, Calcutta and elsewhere, so that Singapore lacked many of the types or authentic material from Ridley's own collections. Further, since many specimens in the herbarium had no identifications written on their labels even when sorted, they were liable to be misplaced in the course of using the herbarium or mending the sheets. When working the *Flora of the Malay Peninsula* I–V (1922–25) Ridley used mainly the duplicate specimens he had sent to Kew, so that most of the specimens in the Singapore Herbarium still remained unlabelled.

Burkill therefore set himself immediately to the task of naming the specimens and indicating appropriately those cited in the large floristic works on Malaya, *The Materials for a Flora of the Malayan Peninsula: Dicotyledons* Vols. I–V by King and later assisted and continued by Gamble (1889–1915) and *Monocotyledons* by Ridley, *Vols. I–III (1907),* and later in Ridley's *Flora of the Malay Peninsula* I–V (1922–25). Further he organised collection trips to Malaya, Sumatra, Java and Sarawak in order to enrich the Singapore herbarium and also to send duplicate specimens to other institutions, so that such duplicates might be compared with types or authentic material in other institutions. Thus about 20,000 specimens were added by way of the collection in the jungles, the duplicates of which were distributed to several herbaria interested in Malaysian systematics and almost an equal number was received in exchange or as gifts, in addition to acquiring a set of Elmer's collection in Borneo and the Philippines. Further several hundreds of specimens of the plants cultivated in the Gardens were made in order to form a herbarium of the Gardens' plants.

It was at this time that Burkill introduced the system of numbering the specimens in the field rather than in the herbarium; for when numbered in the field, one can be sure that the different specimens bearing the same number are from the same collection, whereas, when numbered in the herbarium, specimens from different collections sometimes become mixed together so that the duplicates bearing the same number may not be specifically or varietally identical. The system of numbering the specimens in the field seemed to be so interesting that many foreign botanists who visited the Singapore herbarium often begged a specimen field label to take away with them for adapting it to their conditions.

It was in the course of this re-organization of the herbarium and the library that Burkill laid the foundation for his monumental work, *A Dictionary of the Economic Products of the Malay Peninsula* 2 vols. 2402 pp., elaborated and published in 1935, after his retirement in England. The work of re-organizing the herbarium provided also vernacular names and some information which had to be completed by making a further inquiry among the local people and by consulting the reports of research workers in Malaya, Indonesia, Philippines, India and elsewhere on the plants found in Malaya. The results thus collated were no doubt later incorporated in the Dictionary, but sometimes they formed the subject of special papers in the *Gardens' Bulletin*. Thus Burkill compiled a list of all the persons who had contributed specimens to the Gardens' Herbarium with details of their travels, and this together with the names of other persons who had contributed Malayan plants to other herbaria in the world, formed the subject of a paper with biographical sketches of the collectors published in the *Gardens Bulletin* IV (1927) 113–202, with the following title: *Botanical Collectors, Collections and Collecting Places in the Malay Peninsula: A review of the work so far done towards a knowledge of plantgeography of Malaya.* An inquiry into the simples and crude drugs of Malaya led Burkill to enlist the co-operation of the authorities who could competently work out the collections or manuscripts studied by him. Thus the specimens of Chinese drugs collected by Burkill were worked out by David Hooper and published in *Gardens' Bulletin* Vol. VI Part 1 (1929) 1–163. The prescriptions collected from the Malays by Burkill and Mohammed Haniff were issued as *"Malay Village Medicine"* the Malay names being associated with the botanical names of the plants by Burkill himself, and issued in *Gardens' Bulletin* VI (1930) 165–321. The manuscript book of *"The Medical Book of Malayan Medicine"*, translated by Inche Ismail Munshi, possibly in Penang circa 1886.

was edited by Burkill who gave the botanical determination of the plants, while medical notes were supplied by J. D. Gimlette, who had worked widely on the Malayan medical terminology. (Gard. Bull. VI, 1930 pp. 323–474).

The undertaking to write an account about the Economic Products of Malaya led Burkill to make a survey of the efforts made to acclimatize foreign plants in Malaya. This involved not only culling information from the different published reports but also noting and sorting out the old manuscript records of every plant or seed that was introduced in the Botanic Gardens, which was generally the place to which plants newly introduced into Malaya were sent. The records were classified and made accessible in the herbarium under their respective genus and thence were worked out for the Dictionary.

The inquiry as to success or failure of the introduced plants necessitated a census of all the plants that existed in the Botanic Gardens and in its economic section which is now extinct. Thus the herbarium of the plants in cultivation came into the existence providing often valuable information of the success of plants that were introduced and cultivated in Malaya. Since there were then separate agricultural and forestry departments, the library exchanges and purchases had to be revised so as to make the institution more useful for its specialized purpose of the study of systematic botany. At the same time the Gardens' periodical which had hitherto been *The Agricultural Bulletin of the Straits and Federated Malay States,* was continued with the changed title *"The Gardens' Bulletin, Straits Settlements"*. This change in the title was also necessary since the Malayan Agricultural Department had started a new periodical called *"The Agricultural Bulletin of the Federated Malay States"*, causing thereby much confusion among the foreign public who, at the time, knew very little of Malayan geography and much less of Malayan political divisions.

The development of the Gardens' Department as the systematic centre for Malayan botany and the difficulties of enlisting the services of the botanical institutions in India and England, then suffering from shortage of staff, soon showed that several aspects of research work in the Malayan departments concerned with forestry, agriculture, rubber, malaria, food-stuffs of man and animals, and other subjects could not be carried on without making frequent calls upon the services of the Gardens' Department. An attempt was therefore made to establish a separate systematic research centre in Perak using Wray's herbarium as the basis, but

it proved a failure, because no systematist can provide the services needed by research institutions without a properly organized herbarium and library. Even police cases can be delayed or be misdirected if plants suspected as poisons are not properly identified.

While continuing to co-operate, so far as he was able, with the Malayan Departments of Agriculture and Forestry, Burkill opposed proposals for union of the Botanic Gardens, S.S., with either of these departments. He further insisted on the importance of a herbarium being associated with a garden, where plants could be studied in cultivation, as well as on the necessity of ample opportunity for field study of native plants. When the Research division of the Forestry Department was established, it became evident that that Department was dependent on the herbarium at the Botanic Gardens for a great amount of important information concerning the forest plants of Malaya. Dr. F. W. Foxworthy, the first Forest Research Officer, made frequent visits to Singapore, and collaborated in a study of the seedlings of Dipterocarps which Burkill had started: cf. Journ. Str. Br. Roy. Asiat. Soc. 75 (1917) 43–48; 76 (1917) 161–167; 79 (1918) 39–44; 81 (1920) 1–4 and 49–76; 86 (1922) 281–284 and 285–291; Journ. Malay. Br. Roy. Asiat. Soc. I (1923) 218–222, and with Foxworthy in Journ. Str. Br. Roy. Asiat. Soc. 86 (1922) 271–280.

A proposal was made for the moving of the headquarters of the Gardens Department to Kuala Lumpur, in order that it might be closely associated with the Forest Research Institute (with the possibility of a common library of books and journals on plant taxonomy), and about the time of Burkill's retirement a committee was appointed to make a recommendations to effect this change. But, though there was agreement in principle as to the desirability of the committee's proposals, the Federal Government decided that the cost of new buildings would be too great, and the matter was shelved, later to be completely abandoned; and the Straits Settlements continued to bear the whole cost of what was in effect a Malayan botanical service. The effectiveness of this service was increased during the last years of Burkill's directorship by the addition of two plant taxonomists and one graduate field officer (Holttum, Henderson and Furtado respectively) and a library assistant to the Gardens staff.

Though working under a great handicap, Burkill showed how a trained botanist can use his time in making systematic and biological observations on the many plants that are grown in a

garden and also utilize the facilities available for growing plants to clear certain doubts regarding their botanical affinities, dietetic value, etc. Thus the first two or three volumes of the Gardens' Bulletin contain a large number of notes regarding insect pests, abnormalities, new varieties of orchids, flowering peculiarities of many plants growing in the Gardens, digests of old records on rubber and on the history of the Gardens in Malaya, and observations on the Yams (Dioscorea spp.) grown in the Gardens where he had gathered them from different parts of the world in order to prosecute his studies begun in Calcutta in the company of Dr. (later Sir) David Prain. The following articles might be mentioned since they show the keenness and the breadth of the studies: *"The Positions of the Agricultural Industries in the Straits Settlements in 1913"* (Gard. Bull. I, 1914 pp. 213–235); *"The Treatment to which the Para-Rubber Trees of the Botanic Gardens, Singapore, have been subjected"* (Gard. Bull. I, 1915, pp. 248–295); *"Gordonia"* (Journ. Str. Br. Roy. Asiat. Soc. 76 (1917) 133–159); *"The Establishment of the Botanic Gardens, Singapore"* (Gard. Bull. II, 1918, pp. 55–72); *"The Second Phase in the History of the Botanic Gardens, Singapore"* (Gard. Bull. II, 1918 pp. 93–108); *"The Composition of a Piece of Well-drained Singapore Secondary Jungle Thirty Years Old"* (Gard. Bull. II, 1919 pp. 145–157); *"Some Notes on the Pollination of Flowers in the Botanic Gardens, Singapore, and in other Parts of the Peninsula"* (Gard. Bull. II, 1919 pp. 165–176); *"The Genus Gordonia in the Philippine Islands"* (Philipp. Journ. Sci. XV, 1919 pp. 475–478); *"A List of Oriental Vernacular Names of the Genus Dioscorea"* (Gard. Bull. II, 1924 pp. 121–244).

However Burkill was only for a short space of 13 years in Malaya; and during this period he was busy collecting material for his monumental work of *"A Dictionary of the Economic Products of the Malay Peninsula"*. Naturally these notes and observations had to be worked out in England where he had an access to better library and herbarium facilities and whence he helped, after his retirement, the Gardens' Herbarium to name many of the foreign and other plants that were grown in the Gardens. Each of his articles in the Dictionary is replete with information about the history of the plant, its products, vernacular names, uses, chemical composition of the drug or poison if known, etc. In addition to work on the Dictionary, other studies begun in Singapore or Calcutta were completed in England. Thus *"An Account of the genus Dioscorea in the East"* was published by Prain and Burkill in four

large volumes (two of which are plates), in the *Annals of the Botanic Gardens, Calcutta* in 1937 and 1939. The following papers might also be mentioned: *"The Chinese Mustards in the Malay Peninsula"* (Gard. Bull. V, 1930 pp. 99–117); *"An Enumeration of the Species of Paramignya, Atalantia and Citrus, found in Malaya"* (Gard. Bull. V, 1931 pp. 212–223); *"Notes on Gluta"* (Gard. Bull. V, 1931 pp. 224–230); *"The rise and decline of the Greater Yam in the service of man"* (Avanc. Sci. Lond. VII 1950 pp. 443–448).

Also it may be noted that in addition to many species, at least three genera have been named in honour of Mr. I. H. Burkill, namely, *Burkillia,* West and West, Protococcaceae (1907), *Burkillia* Ridley, Leguminoseae (1925) and *Burkillianthus* Swingle, Rutaceae (1938).

Phellodendron, a genus of trees new to the Malayan flora (Rutaceae)

By C. G. G. J. VAN STEENIS

Flora Malesiana Foundation, Leyden

FOR SOME TIME I have been defeated in identifying a sheet from the Malay Peninsula with decussate, pinnate, exstipular leaves and choripetalous, 5–merous, male flowers. It would seem that the choice was so much narrowed by these characters, that identification would have been easy. And though it is now certain, that it belongs to *Phellodendron* of the Rutaceae, it remains still remarkable that the leaves of this genus do not show the distinct pellucid glands which are so typical for rutaceous plants. There are indeed minute, pin-like pellucid glands (crystal cells?) in the parenchyma but of essentially smaller size than is usual in Rutaceae. It is true that Sprague (Kew Bull. 1920, 231) and Engler (Pfl. Fam. ed. 2, 19a 1931, 298) mention the occurrence of a large pellucid gland near each of the shallow leaf-crenations, but this appears to be frequently indistinct in the sheets of the genus preserved in the Rijksherbarium. See also Blenk, Flora 67 (1884) 278.

Phellodendron burkillii n.sp.—Fig. 1.

Arbor, 18 m. alta, c. 35 cm. diam. Ramuli, foliorum raches, petioluli et inflorescentiae axes laterales primarii appresse puberuli. Folia 4–6-jugata, foliolis oblique ovato-oblongis ad sublanceolatis, acuminatis, acumine longo angusto saepe falcato, 6–10 × 2–3 cm., subtus in costae parte inferiore puberulis, ceterum glabris. Corymbus axibus conspicue decussatis, multiflorus, c. 10–12 cm. longus, 15–20 cm. latus. Flores subglabri. Calycis lobi. 1/3 mm., triangulares. Petala c. 2¾ × 1 mm., intus ad venam medianam pilis paucis retrorsis suffulta. Filamenta in parte inferiore pilis longis patentibus munita. Ovarium glabrum. Styli pilis erectis parcissime pubescentes.

Typus: KEP 78904, L.

Tree 18 m. tall, 35 cm. diam. Twigs with very few lenticels, pithy, as the petioles, leaf-rachis, and inflorescential stalks puberulous, terete, but flattened at the nodes. Leaves decussate, with

4–6 pairs of leaflets, c. 20–30 cm. long; leaflets c. 4–6 pairs, dull, ±glaucous underneath, obliquely ovate-oblong to sublanceolate, long- and narrow-, often falcate-acuminate, 6–10 by 2–3 cm, base cuneate and on the acroscopical side often ± rounded, ultimate base short-decurrent into the petiolule; nerves c. 6–8 pairs, inconspicuous, as the very dense venation not or obscurely prominent; margin obsoletely crenate, in the crenations often an obsolete, pellucid dot; petiole 3–6 cm; petiolules c. 3 mm. Terminal corymb wide (c. 15–20 cm.), c. 10–12 cm. high, richly branched and with numerous flowers. Calyx c. 1 mm. diam., ½ mm. high, the lobes acute-deltoid. Mature buds broad-elliptic almost globular, 2 mm. long. Petals oblong-elliptic, the margins very narrowly imbricate, c. 2½ times as long as wide, boat-shaped, c, 2½ by 1 mm., tip thickened, retrorse, glabrous but for some appressed, retrorse hairs on the midrib within. Stamens 5, erect in bud, the filaments considerably lengthening during anthesis and becoming longer than the anthers (c. 2–2½ mm.), the lower half with scattered, patent, long hairs; anthers free in the lower half and ± sagittate, basifixed, acute-oblong, c. 1¾ mm. long. Ovary in ♂ rudimentary, 5-angled, c. ½ mm. high, glabrous, with 5 erect, appressed styles ½ mm. high, with a few appressed-erect hairs.

Malay Peninsula. Kedah: Enggang Forest Reserve, Sik, KEP 78904 (L, type, KEP, K, SING, distributed as Micromelum pubescens Bl.), low-lying ground, bark smooth, grey-green, flowers greenish-white, July 12, 1956.

The closest ally of this species seems to be *P. macrophyllum* Dode from East Szechuan, China (Bull. Soc. Bot. Fr. 55, 1908, 648) which is, however, clearly specifically distinct, as appeared from an examination of the type which was kindly loaned to me by the Director of the Paris Herbarium. The differential characters are that it has 2–4-jugate leaves (in the type sheet 2-jugate); leaflets large, 10–15 (–20) by 5–8 (–9) cm., broad-elliptic, abruptly acuminate, pubescent beneath on the main rib, venation and intervenium, with a much coarser venation than in *P. burkillii,* without marginal glandular dots, but with very numerous dots of microscopic size and scattered large pellucid dots (as yet unknown in the genus); inflorescence with very thick, lenticellate dark-coloured peduncle and axis; flowers very dense; mature buds 3 mm.; calyx 1 mm. high. Petals 3 by 1 1/3 mm. Styles patent long-villose. Fruit globular, 10 by 9 mm.

The genus is a truly East Asian—one of Sino-Japanese distribution, north to Manchuria, south to Formosa.

Phellodendron burkillii Steen. a, Flowering twig, × 2/5. b, flower. c, stamen. d, pistil, all × 6 (after KEP 78904, L.).
—*Phellodendron macrophyllum* Dode. e, flower. f, stamen. g, pistil, all × 6 (after Farges 1284, P.).

If such temperate to subtemperate ligneous genera occur in the South-east Asian tropics they are generally found in the montane zone, as for example in *Pentaphylax, Osmanthus, Camellia, Anneslea, Distylium, Schoepfia, Pistacia* (in Luzon), etc. This is not always the case, as of *Acer,* which belongs in this group, two lowland localities have been recorded in addition to dozens in the montane zone.

There is as far as I know one temperate to subtemperate ligneous genus which only occurs in the lowland in Malaya and that is *Pistacia malayana* Henderson; this shows an ecologically similar behaviour as this new record of *Phellodendron.*

Vegetative characters distinguishing the various groups of ferns included in Dryopteris of Christensen's Index Filicum, and other ferns of similar habit and sori

By R. E. Holttum

In a series of papers begining in 1907, mainly on American species, Christensen himself showed a way in which natural groups within Dryopteris *sens. lat.* of his *Index Filicum* could be distinguished, the significant diagnostic features being provided by hairs and scales on the fronds. Though he never published a formal conspectus of the whole group, he continued to develop his ideas (see Christensen 1938). Ching's series of papers on Dryopteris and other genera of China, published from the year 1933 onwards, carried the general investigation much further, dealing with the ferns of Asia not considered in Christensen's earlier work. Ching also used the characters (both external and internal) shown by a cross-section of the rachis, and the relation of rachis to pinna. The use of this last kind of character was developed further by me, and is most fully set forth, with some illustrations, in my book on the ferns of Malaya (1954). In trying to understand more clearly the limits of some of the genera concerned, I have been much impressed by the significance of these characters, and to clarify my thinking I have attempted a concise comparative presentation of them, as set forth at the end of the present paper. It appears to me that Ching did not pursue effectively the line of thought which he himself indicated when showing the distinction between rachis-characters of Ctenitis and Dryopteris (*sens. strict.*); if he had done so, he would not have suggested that Athyrium and Thelypteris are closely related, nor that *Rumohra adiantiformis* belongs to the same genus as the Dryopteroid ferns which he associated with it.

I have been especially impressed by the importance of the external shape of the rachis, and the way in which this shape is modified when a pinna-rachis (or a simple pinna) is attached to it. These characters are extremely uniform in genera which, as judged by other characters, are seen to be natural ones, and I believe that all the more highly evolved genera have each a particular rachis-form. When however one looks at Dennstaedtia, Hypolepis

and related genera, which have various primitive characters and seem to be survivors of a very basic group, one finds less uniformity, and I believe that in this group one can see the beginnings of both the Tectaria and Dryopteris rachis-characters, now so strongly differentiated in these two more highly evolved genera. I believe that the limits of the genera Dennstaedtia and Hypolepis are not at present clearly defined, and that a further study of these genera, with rachis-characters (as well as other factors) in mind, may yield significant results.

There is a sharp distinction between the kind of grooved rachis shown by Dryopteris proper (the groove opened to admit the groove of a pinna-rachis) and on the other hand the kind of rachis which, even if it has a median groove, does not open its groove to admit a pinna-rachis groove. In ferns showing the second of these alternatives, as for example the Thelypteroid ferns, the main rachis and the costae of pinnae are grooved on the upper surface, but the groove of the rachis does not open to admit the groove the costa (the latter is in fact usually not grooved at its base). In Tectaria and Ctenitis there is no median groove in the upper surface of rachis or of costae of pinnae, though in Pleocnemia (Holttum 1951) there is a slight median groove. Ctenitis and Tectaria are characterized also by the short multicellular hairs pointed out by Christensen (he called them Ctenitis-hairs). But there are genera which have the rachis-form of Dryopteris and hairs not much different from those of Ctenitis (e.g. Stenolepia v.A.v.R.).

A quite distinct kind of rachis is found in Davallia and some other genera. Here the middle of the upper surface of the rachis is raised, and on either side of this raised median band, in all smaller rachises, is a slight groove, the outer edge of the groove forming a very firm narrow wing; the thickened edge of the lamina of a leaflet is decurrent on this wing, the raised midrib of the leaflet joining the side of the raised median band of the upper surface of the rachis. An almost exactly similar arrangement occurs in Pteridrys (Ching & C.Chr. 1934), but in rhizome this genus is very different from Davallia. An indication of how this arrangement of the rachis may develop in the Tectaria group of genera is given by Lastreopsis Ching (united with Ctenitis by Copeland; recently distinguished, with a list of species, by Miss Tindale). In Lastreopsis the thickened lower edge of the lamina of a leaflet is decurrent on the rachis-wing, but this wing is usually much more lateral on the rachis than in Pteridrys.

The Davallia type of rachis is shown by *Rumohra adiantiformis* (Forst.) Ching, and this same species also has a dorsiventral

rhizome of Davallia type, so that a sterile plant of *R. adiantiformis* might well be identified as Davallia. The spores of this species also are like those of Davallia, not like those of Dryopteris and Polystichum (Harris 1955, pl. 7, f. 2). It seems to me therefore proved that Ching and Copeland were mistaken in associating species allied to Dryopteris and Polystichum with Rumohra. For these latter species, I have used the name Polystichopsis, but I am not at all satisfied that they form a natural group, and I believe that the matter needs further investigation. Furthermore, Mr. C. V. Morton has pointed out to me that the generic name Polystichopsis was first used in a different sense, and he is elsewhere proposing another name.

In the following conspectus I have not attempted to distinguish the genera of the Thelypteroid group, because I believe that more study is needed to establish clearly their distinctive characters. Everybody admits that a distinction between Thelypteris (or Lastrea) and Cyclosorus on the characters of free or anastomosing veins is a quite unnatural one. One could include all species in one genus, but then subgenera would need to be distinguished. For example, *Lastrea oreopteris* is surely very different from *Thelypteris palustris*, and both are very different from the group of species to which *Thelypteris brunnea* (Wall.) Ching belongs. Cytological evidence (Manton, Manton & Sledge) indicates that some species with free veins are more closely related to Cyclosorus than to other free-veined species, and probably such species should be united to Cyclosorus; but other morphological characters need to be established.

As regards the genera of the Tectaria group, it seems to me that Ctenitopsis Ching should be united to Tectaria, not to Ctenitis as in Copeland's Genera Filicum. Just as a division between Thelypteris and Cyclosorus on whether veins are free or not in unnatural, so also is a division between Tectaria and Ctenitopsis. The series of forms included in *Dryopteris dissecta* (Forst.) O. Ktze, which belong to Ctenitopsis, have exactly the frond-form of some species of Tectaria. Perhaps Ctenitis itself needs further subdivision, allowing some sections of it to be associated with Tectaria. I formerly attempted to distinguish Heterogonium from Tectaria on frond-form (I see no other practicable distinction) but now I am not sure whether this group should have generic separation. *Aspidium boryanum* Willd. (included by Copeland in Ctenitis) resembles Ctenitis rather than Dryopteris in external form of the rachis, but differs from both in the vascular anatomy of the stipe. I believe that this species (with some others which are closely

related to it) is nearer to Athyrium than to Ctenitis, but quite distinct from Athyrium, in which genus I placed it in my book on the ferns of Malaya (p. 567); in so doing I unfortunately made the mistake of referring to it specimens which are in fact Athyrium. Later (1959) I proposed a new generic name Parathyrium for *Aspidium boryanum* Willd. and its allies, but this was antedated by Dryoathyrium Ching (1941), based on the same type species.

In the following conspectus, Gymnocarpium (sensu Ching 1933) is shown as belonging to the Dryopteris group, not with Thelypteris (Lastrea) where Copeland placed it (1947, p. 137), and cytological evidence confirms this position. *Dryopteris phegopteris* (L.) Chr., on the other hand, belongs to the Thelypteris group. I believe that Copeland overlooked both hairs and rachis-characters when he wrote of these two that "their separation by reasonable generic definition is hardly possible". Similarly, I believe that the conspectus shows a clear separation between Athyrium and the Thelypteris group (on hairs, scales and rachis-characters), though both Ching and Copeland held that they were so closely allied as to be hardly separable in formal terms.

Cornopteris Nakai was based on a species like Diplazium and Athyrium in rachis-characters but lacking an indusium. *Hemionitis opaca* Don (in Dryopteris in the original Index Filicum of Christensen, transferred later to Diplazium by Christ) is very closely related to the type species of Cornopteris, and other species have been noted by Ching. Madame Tardieu-Blot however has added to the genus Cornopteris some of the species of the alliance of *Aspidium boryanum* Willd. (1956, 1958); the distinction between true Cornopteris and these species is shown in the present conspectus.

The genus Hypodematium has abundant needle-like unicellular hairs on its fronds, resembling in this the Thelypteroid ferns. Its scales however are quite different from those of Thelypteris, and I do not think that Hypodematium is of the Thelypteris alliance: on the other hand, I am not sure that it really belongs with the Tectaria group of genera.

Rhizome not dorsiventral (leaves and roots equally all round); wing of pinna-rachis, if present, thin like the lamina, except in Pteridrys and Lastreopsis

Main rachis lacking a median groove on upper surface; or if grooved, the groove not open to admit grooves of pinna-rachises; rachis sometimes winged, the wing joining the edge of the lamina of leaflets, not the edge of the costa of a leaflet

Hairs on upper surface of rachis multiseptate, usually very short; scales lacking superficial hairs or glands

Several separate vascular bundles throughout the stipe **Tectaria group**

A tooth present at the base of each sinus between lobes of the lamina

Veins free; vascular bundles in stipe in a simple ring *Pteridrys*

Veins anastomosing; vascular bundles in more complex arrangement *Pleocnemia*
Arcypteris

No tooth present in sinus between two lobes of lamina

Basal basiscopic vein of a vein-group springing directly from the costa, not from the costule which bears the other veins of the group; or veins much anastomosing *Tectaria*
(incl. Ctenitopsis)

Basal basiscopic vein of a vein-group springing from the costule; veins always free

Indusium peltate; hairs on rachis few, mainly near junction of rachis and pinnae on upper surface *Dryopolystichum*

Indusium reniform; hairs many throughout rachis

Decurrent wing of lamina not thickened *Ctenitis*

Decurrent wing of lamina thickened *Lastreopsis*

One U-shaped bundle in the stipe (2 bundles near base) *Dryoathyrium*

Hairs on upper surface of rachis unicellular, more or less needle-like; two vascular bundles in base of stipe, uniting upwards to one of U-shape

Scales lacking superficial hairs or glands, confined to swollen bases of stipes *Hypodematium*

Scales bearing superficial glands or hairs, not confined to base of stipe which is not swollen **Thelypteris group**

Main rachis with median groove in upper surface, this groove open to admit grooves of pinna-rachises; raised edge of a pinna-rachis groove joined to side of pinnule-costa groove, edge of pinnule-lamina decurrent on pinna-rachis as a lateral wing

Multicellular hairs, of a kind quite different from scales, lacking; groove of rachis quite smooth within **Dryopteris-group**

Several vascular bundles in stipe — *Dryopteris*, *Polystichum*, *"Polystichopsis"*

Two vascular bundles in stipe — *Gymnocarpium*

Multicellular hairs, quite different from scales, often present; groove of rachis papillate within; some sori elongate and asymmetric or unilateral; two vascular bundles at base of stipe **Athyrium group**

Sori indusiate — *Athyrium*

Sori not indusiate — *Cornopteris*

Rhizome dorsiventral (roots from lower surface, leaves from upper surface); pinna-rachis bearing a firm wing, edge of lamina thickened at base and decurrent on the rachis-wing; midrib of pinna raised, not grooved **Rumohra** (*s. str.*)

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Taxonomic Notes on Ficus Linn., Asia and Australasia

I. SUBGEN. UROSTIGMA (GASP.) MIQ.

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Summary

New sections, subsections, series and subseries.—sect. *Urostigma* ser. *Superbae* Corner, ser. *Caulobotryeae* (Miq.) Corner, ser. *Orthoneurae* Corner.—sect. *Leucogyne* Corner.—sect. *Conosycea* (Miq.) Corner subsect. *Conosycea* ser. *Drupaceae* Corner, subser. *Indicae* Corner, subser. *Zygotricheae* Corner, subser. *Crassirameae* Corner; subsect. *Dictyoneuron* Corner ser. *Glaberrimae* Corner, ser. *Dubiae* Corner, ser. *Subvalidae* (Miq.) Corner, ser. *Perforatae* Corner; subsect. *Benjamina* (Miq.) Corner ser. *Callophylleae* Corner; sect. *Malvanthera* Corner ser. *Malvanthereae* Corner, subser. *Eubracteatae* Corner, subser. *Platypodeae* Corner, subser. *Hesperidiiformes* Corner, ser. *Cyclanthereae* Corner.—sect. *Galoglychia* (Gasp.) Endl. (subgen. *Bibracteatae* Mildbr. et Burr.).

Earlier specific epithets.—*F. virens* Ait. (*F. infectoria* sensu Roxb., *F. lacur* auct., non verae), *F. costata* Ait. (*F. caudiculata* Trim.), *F. depressa* Bl. (*F. pruniformis* Bl.), *F. drupacea* Thunb. (*F. pilosa* Reinw.), *F. crassiramea* Miq. (*F. procera* auct., non Bl.), *F. sundaica* Bl. (*F. indica* sensu King, non Linn. which is reduced to *F. benghalensis* Linn.), *F. retusa* Linn. (*F. truncata* Miq.), *F. pellucido-punctata* Griff. (*F. gelderi* Miq.), *F. pisocarpa* Bl. (*F. microstoma* Wall. ex King), *F. subcordata* Bl. (*F. garciniifolia* Miq), *F. microcarpa* Linn. f. (*F. retusa, F. nitida, F. retusa* var. *nitida* auct., non verae).

New names for later homonyms.—*F. hookeriana* Corner (*F. hookeri* Miq), *F. subtecta* Corner (*F. procera* Bl.), *F. maclellandi* King var. *rhododendrifolia* Corner (*F. rhododendrifolia* Miq.), *F. curtipes* Corner (*F. obtusifolia* Roxb.), *F. subpuberula* Corner (*F. puberula* Miq.).

New species.—*F. subgelderi* Corner et v. *rigida* Corner, *F. paracamptophylla* Corner, *F. delosyce* Corner et var. *obtusa* Corner, *F. spathulifolia* Corner et var. *annamensis* Corner, v. *substipitata*

Corner, *F. calcicola* Corner, *F. episima* Corner, *F. tristaniifolia* Corner, *F. palaquiifolia* Corner, *F. polygramma* Corner, *F. benjaminoides* Corner, *F. patellata* Corner, *F. triradiata* Corner et var. *sessilicarpa* Corner, *F. augusta* Corner.

New varieties.—*F. superba* Miq. v. *alongensis* (Gagnep.) Corner, v. *henneana* (Miq) Corner; *F. concinna* Miq. v. *subsessilis* Corner; *F. virens* Ait. v. *sublanceolata* (Miq.) Corner, v. *glabella* (Bl.) Corner; *F. caulocarpa* Miq. v. *dasycarpa* Corner; *F. prolixa* Forst. f. v. *subcordata* Corner; *F. arnottiana* Miq. v. *subcostata* Corner; *F. drupacea* Thunb. v. *auranticarpa* (Elm.) Corner, v. *glabrata* Corner, v. *pedicellata* Corner, v. *pubescens* (Roth) Corner (*F. mysorensis* Heyne); *F. cucurbitina* King v. *eubracteata* Corner; *F. cordatula* Merr. v. *sericea* (C. B. Robinson) Corner; *F. pubilimba* Merr. v. *ovata* Corner; *F. stupenda* Miq. v. *minor* Corner; *F. crassiramea* Miq. v. *brevicupulata* Corner, v. *celebica* Corner v. *clementis* (Merr.) Corner, v. *patellifera* (Warb.) Corner; *F. forstenii* Miq. v. *pacifica* (Elm.) Corner, v. *umbobracteata* (Elm.) Corner, v. *villosa* Corner; *F. glaberrima* Bl. v. *bracteata* Corner, v. *siamensis* Corner; *F. sundaica* Bl. v. *beccariana* (King) Corner; *F. lowii* King v. *borneensis* Corner, v. *minor* Corner; *F. sumatrana* Miq. v. *circumscissa* Corner, v. *microsyce* Corner, v. *subsumatrana* (Gagnep.) Corner; *F. retusa* Linn. v. *borneensis* Corner; *F. binnendykii* Miq. v. *coriacea* Corner, v. *cupulata* Corner, v. *latifolia* Corner; *F. subcordata* Bl. v. *malayana* Corner; *F. benjamina* Linn. v. *bracteata* Corner; *F. callophylla* Bl. v. *leytensis* Corner, v. *malayana* Corner, v. *minor* Corner; *F. microcarpa* Linn. f. v. *microcarpa* f. *pubescens* Corner, v. *eubracteata* Corner, v. *hillii* (Bailey) Corner, v. *latifolia* (Miq.) Corner, v. *naumanni* (Engl.) Corner, v. *saffordii* (Merr.) Corner; *F. glandifera* Summerh. v. *brachysyce* Corner; *F. leucotricha* Miq. v. *megacarpa* F.v.M. ex Corner, v. *sessilis* Corner; *F. obliqua* Forst. f. v. *petiolaris* (Benth.) Corner, v. *puberula* (Benth.) Corner; *F. hesperidiiformis* King v. *myrmekiocarpa* (Summerh.) Corner; *F. xylosycia* Diels v. *cylindrocarpa* (Diels) Corner.

Mixtae compositae.—*F. caulobotrya* Miq., *F. onusta* Wall. ex Miq. (see under *F. globosa* Bl.).

In recent works on the classification of Ficus insufficient attention has been given to the names of subdivisions made by Miquel. These must be typified and re-introduced with minimum of disturbance, but a pre-requisite is a full understanding of all his

species. The last to attempt this was King (1887–88), and he was obliged to leave many uncertain. Since 1950 I have worked on the revision of the Asiatic and Australasian species, using the large collection of the Singapore Herbarium as the study-collection, and, with the indispensable assistance of the herbaria of Leiden, Utrecht, Bogor, and Kew (for many of Miquel's types are in the Hooker Herbarium), I have succeeded in recognising every taxon described by Miquel from *forma* to *genus*. This series of papers gives the bare taxonomic results: botanical appreciation must await full publication. I should add that, until one can identify leaves in particular from microscopic structure, it is commonly impossible to identify many types. Hence I acknowledge with gratitude my apprenticeship through the Singapore herbarium and my progress through the courtesy of the Directors and staff of the herbaria of Europe, Asia, New Guinea, and Australia, namely of the British Museum, Kew, Edinburgh, Paris, Florence, Leiden, Utrecht, Copenhagen, Berlin, Calcutta, Bogor, Manila, Lae, Brisbane, and Adelaide. Thus I have studied over twenty thousand collections, not counting the abundant duplicates. Further, in special matters, I have received great help from the herbaria of Stockholm, Uppsala, Geneva, Turin, Caen, the Arnold Arboretum, the New York Botanic Garden, and the Smithsonian Institution. The funds for this work have come mainly from the Cambridge Botany School, but also from the Leverhulme Trust, the Nuffield Foundation, and the Royal Society. To all these persons and institutions, and to the many field-botanists who have joined the quest, I express my gratitude. Taxonomy, of course, is a means to an end, and what I have in mind is the evolution of tropical forest as seen through one of its major constituents.

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subgen. Urostigma (Gasp.) Miq.

Ann. Mus. Bot. Lugd. Bat. 3 (1867) 285.—*Urostigma* Gasp. Parl. Giorn. Bot. 2 (1844) 214; Ann. Sci Nat. ser. 3, 3 (1845) 343.—sect. *Urostigma* (Gasp.) Endl. Gen. Pl. 4, 2 (1847) 35. Lectotype—*F. religiosa* Linn.

Gasparrini listed seven species without indication of a type. Endlicher, in reducing the genus to a section, cited merely *F. religiosa* Linn. and *F. glaucophylla* Desf., which had not been mentioned by Gasparrini. Hence I take *F. religiosa* as the lectotype and it has always served as a typical member of the taxon *Urostigma*.

sect. **Urostigma.**—Figs with interleafing apical bracts. Male flowers generally ostiolar. Ovaries entirely red-brown or in the upper half. Cystoliths only on the lower side of the lamina. Petiole often articulate to the lamina. Lectotype—*F. religiosa* Linn.

I divide this into four series.

1. ser. **Religiosae** Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 287.—*Urostigma* Gasp. ser. *Religiosa* Miq. Fl. Ind. Bat. 1, 2 (1859) 332.—Fig sessile (except *F. verruculosa* Warb., Africa): basal bracts persistent: internal bristles none, or few and minute. Lamina without hypodermis. Type—*F. religiosa* Linn.

2. ser. **Superbae** Corner ser. nov.—Receptacula pedunculata (raro sessilia), bracteis basalibus caducis, setis internis nullis v. paucis minutisque. Lamina hypodermide deficiens. Typus—*F. superba* Miq.

3. ser. **Caulobotryae** (Miq.) Corner comb. nov.—*Urostigama* Gasp. ser. *Caulobotrya* Miq. Fl. Ind. Bat. 1, 2 (1859) 334.—Fig sessile or pedunculate: basal bracts persistent: internal bristles abundant, chaffy-vesicular, white. Lamina without hypodermis. Lectotype—*F. caulocarpa* Miq.

Miquel gave *Urostigma superbum* Miq., *U. caulocarpum* Miq., and *U. stipulosum* Miq. for this series. The last two are the same and the first I exclude as ser. *Superbae*.

4. ser. **Orthoneurae** Corner ser. nov.—Receptacula sessilia v. pedunculata, bracteis basalibus persistentibus, setis internis nullis. Flores masculi dispersi. Petiolus non v. vix articulatus. Lamina superne hypodermide unistratoso, cuticula inferiori gyroso-plicata, praedita. Typus—*F. orthoneura* Lévl. et Vant.

sect. **Leucogyne** Corner sect. nov.—Receptacula sessilia, bracteis apicalibus interpositis. Flores masculi dispersi. Ovaria albida, haud rubromaculata. Lamina superne hypodermide 1–2-stratoso, cystolithis solum pagina superiori, praedita. Petiolus haud v. vix articulatus. Typus—*F. rumphii* Bl.

This section includes *F. rumphii,* so often mistaken for *F. religiosa,* and *F. tsiela* Roxb., which is close. Possibly *F. menabeensis* H. Perr. (Madagascar) belongs here, but I am unable to place this species satisfactorily.

sect. **Conosycea** (Miq.) Corner comb. nov.—*Urostigama* Gasp. sect. *Conosycea* Miq. Fl. Ind. Bat. 1, 2 (1859) 349.—Figs sessile or pedunculate, apical bracts interleafing. Male flowers disperse. Ovaries white with a red mark at the base, at least on the stylar side, or the lower half red. Petiole not articulate. Lamina

generally with an upper hypodermis, cystoliths on both sides or only on the upperside, rarely none. Lectotype—*F. annulata* Bl.

This section was based on eleven species, namely *U. altissimum* (Bl.) Miq., *U. excelsum* Miq. (= *F. tinctoria* Forst. f., subgen. *Ficus* sect *Sycidium* Miq.), *U. bicorne* Miq. (= *F. drupacea* Thunb.), *U. conocarpum* Miq. (= *F. annulata* Bl.), *U. pilosum* (Reinw.) Miq. (= *F. drupacea* Thunb.), *U. giganteum* Miq. (= *F. stupenda* Miq.), *U. pruniforme* (Bl.) Miq. (= *F. depressa* Bl.), *U. depressum* (Bl.) Miq., *U. benghalense* (Linn.) Miq., *U. annulatum* (Bl.) Miq., and *U. xylophyllum* Miq. I select *F. annulata* Bl. as the lectotype because it is named twice, because its close ally *F. depressa* Bl. is named twice, because it is well-known and a good representative of this major section, and because it has the conoid fig. Miquel did not use the section later. I recognise three subsections with several series and subseries, as follows.

A. subsect. **Conosycea.**—Venation with intercostals. Type—*F. annulata* Bl.

1. ser. **Validae** Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 285.—*Urostigma* Gasp. ser. *Valida* Miq. Fl. Ind. Bat. 1, 2 (1859) 334.—Fig pedunculate, ripening green, brown, or brownish orange. Lectotype—*Urostigma valida* (Bl.) Miq. (= *F. annulata* Bl.).

I choose this type because Miquel obviously chose the name from this species. It occurs, also, as *U. flavescens* (Bl.) Miq., and its ally *F. globosa* occurs twice also, as *U. globosum* (Bl) Miq. and *U. manok* Miq. Further, this choice gives the lectotype of sect. *Conosycea* the position also of lectotype of a series.

2. ser. **Drupaceae** Corner ser. nov.—Receptacula sessilia v. pedicellata, haud pedunculata, maturitae lutea, aurantiaca, dein rubra. Typus—*F. drupacea* Thunb. (= *F. pilosa* Reinw.).

a. subser. **Drupaceae.**—Receptacula ellipsoidea, oblonga v. pyriformi-pedicellata, bracteis basalibus plerumque conditis, apicalibus plerumque gibbosis. Lamina costis basalibus haud elongatis, cystolithis amphigenis. Typus—*F. drupacea* Thunb.

b. subser. **Indicae** Corner subser. nov.—Receptacula subglobosa v. ellipsoidea, bracteis basalibus plerumque conspicuis, apicalibus disco plano instructis. Lamina nervulis reticulatis ad paginas ambas leviter elevatis (sicco), cystolithis solum ad paginam superiorem v. nullis. Typus—*F. benghalensis* Linn.

c. subser. **Zygotricheae** Corner subser. nov.—Receptacula subglobosa, ut in subser. *Indicae*. Cystolitha amphigena. Pili brunnei copiosi, microscopice binati. Typus—*F. consociata* Bl.

The microscopically twinned hairs are characteristic of *F. consociata* and its close ally *F. bracteata* Wall.

d. subser. **Crassirameae** Corner subser. nov.—Receptacula subglobosa, oblonga, v. pyriformia, ut in subser. *Indicae*. Cystolitha amphigena. Pili hyalini v. nulli, haud binati. Typus—*F. crassiramea* Miq.

B. subsect. **Dictyoneuron** Corner subsect. nov.—Lamina intercostis subparallelis deficiens, costis primariis multo majus evolutis quam costis secondariis; cystolithis amphigenis, raro nullis. Typus —*F. sundaica* Bl. (= *F. indica* sensu King, vide infra).

1. ser. **Glaberrimae** Corner ser. nov.—Receptacula pedunculata, bracteis basalibus parvis v. nullis, ostiola non pertuso. Typus—*F. glaberrima* Bl.

2. ser. **Dubiae** Corner ser. nov.—Receptacula pedicellata, haud pedunculata, bracteis basalibus parvis v. minutis, ostiolo haud pertuso. Typus—*F. dubia* Wall. ex King.

3. ser. **Subvalidae** (Miq.) Corner comb. nov.—*Urostigma* Gasp. ser. *Subvalida* Miq. Fl. Ind. Bat. 1, 2 (1859) 339. Fig sessile: basal bracts well-developed: apical bracts in a disc, not perforate. Typus—*F. sundaica* Bl.

This group was described under *Urostigma* Gasp. in series-form and 19 species were ascribed to it. I dispose these species as follows:—

a. subgen. *Sycomorus:*—*U. lucescens* Bl. (= *F. racemosa* Linn. var. *elongata* King);

b. subgen. *Pharmacosycea:*—*U. hasseltii* Miq. (= *F. pubinervis* Bl.);

c. subgen. *Ficus* sect. *Sycidium:*—*U. virgatum* Reinw. ex Bl. (= *F. virgata* Reinw. ex Bl.);

d. subgen. *Urostigma:*—

(i) sect. *Conosycea* Miq. subsect. *Conosycea* ser. *Drupaceae* Corner subser. *Crassirameae* Corner:—*U. crassirameum* Miq.;

(ii) sect. *Conosycea* Miq. subsect. *Dictyoneuron* Corner:—*U. sundaicum* Bl., *U. glaberrimum* Bl., *U. sumatranum* Miq., *U. binnendykii* Miq., *U. zollingerianum* Miq. (= *F. sumatrana* Miq.), *U. peracutum* Miq. (= *F. binnendykii* Miq.), *U. pseudorubrum* Miq. (= *F. sundaica* Bl.);

(iii) sect. *Conosycea* Miq. subsect. *Benjamina* Miq. ser. *Callophylleae* Corner:—*U. clusioides* Miq. (= *F. callophylla* Bl.);

(iv) sect. *Urostigma:*—*U. infectorium* sensu Miq. (= *F. virens* Ait.), *U. canaliculatum* Miq. (= *F. virens* Ait. var. *glabella* Bl.), *U. glabellum* (Bl.) Miq. (= *F. virens* Ait. var. *glabella* Bl.), *U. moritzianum* Miq. (= *F. virens* Ait. var. *glabella* Bl.), *U. timorense* Miq. (= *F. virens* Ait.), *U. concinnum* Miq., *U. parvifolium* Miq. (= *F. concinna* Miq.).

Clearly the name should be used for one of the two larger groups d (ii) or (iv), but d (iv) is already covered by the simultaneous *Urostigma* Gasp. ser. *Caulobotrya* Miq. Therefore, I assign it to d (ii) as sect. *Conosycea* subsect. *Dictyoneuron* ser. *Subvalidae* with *F. sundaica* Bl. as the type-species.

4. ser. **Perforatae** Corner ser. nov.—Receptacula sessilia, bracteis basalibus bene evolutis, ostiolo pertuso, bracteis apicalibus parvis non in discum planum instructis. Typus—*F. pisocarpa* Bl. (= *F. microstoma* Wall. ex Miq.).

C. subsect. **Benjamina** (Miq.) Corner comb. nov.—*Urostigma* Gasp. ser. *Benjamina* Miq. Fl. Ind. Bat. 1, 2 (1859) 344.—Venation without intercostals, the secondary lateral nerves almost or quite as strongly developed as the primary. Fig sessile, rarely pedunculate or pedicellate. Type—*F. benjamina* Linn.

1. ser. **Benjamineae** Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 287.—Leaves subdistichous, thinly coriaceous, drying grey-green to light brown: nerves distinctly raised on both sides (dried): basal nerves not elongate. Type—*F. benjamina* Linn.

2. ser. **Callophylleae** Corner ser. nov.—Folia spiraliter vel subdistiche disposita, sicco fusca v. fuscobrunnea, saepe coriacea: petiolo saepe nigro: costis basalibus saepe elongatis. Typus—*F. callophylla* Bl.

sect. **Stilpnophyllum** Endl. Gen. Pl. 4, 2 (1847) 35. Typus—*F. elastica* Roxb.

sect. **Malvanthera** Corner sect. nov.—Receptacula ostiolo bilabiato vel triradiato, bracteis apicalibus internisque inflexis (haud interpositis), bracteis basalibus 2–3 saepe caducis, praedita. Flores masculi dispersi: antheris uniloculatis, saepe reniformibus, aut longitudinaliter crescentiforme dehiscentibus aut transversaliter. Ovarium aut liberum basim versus rubromaculatum aut plus minus in receptaculo immersum et apicem versus rubrum: stigmate bifido v. simplo. Costae primariae et secundariae ut in *F. elastica* quasi aequaliter evolutae, intercostis nullis. Typus—*F. macrophylla* Desf.

This section resembles in the inflexed apical and internal bracts the African sect. *Galoglychia* (= *Bibracteatae*), but differs in the unilocular anther with two, not four, pollen-sacs. It consists of 19

species of Eastern Malaysia and Australia. I distinguish two series and four subseries.

1. ser. **Malvanthereae** Corner ser. nov.—Anthera reniformia. longitudinaliter crescentiforme dehiscentia. Typus—*F. macrophylla* Desf.

a. subser. **Eubracteatae** Corner subser. nov.—Bracteae basales 3, magnae, persistentes. Receptacula sessilia v. breviter pedunculata, ostiolo triradiato. Ovarium liberum, stigmate simplici. Typus—*F. triradiata* Corner sp. nov. (vide infra).

b. subser. **Malvanthereae.**—Bracteae basales 2 (? 3), mox caducae, magnae. Receptacula pedunculata. Ovarium in receptaculo semi-immersum, stigmate simplici v. breviter bifido. Typus—*F. macrophylla* Desf.

c. subser. **Platypodeae** Corner subser. nov.—Bracteae basales 2 v. 3, magnae, caducae. Receptacula pedunculata v. sessilia, 6–13 mm. lata (sicco). Ovarium liberum, stigmate simplici. Lamina saepe parva (2–16 × 1.5–7.5 cm.), costis secundariis saepe minus evolutis. Typus—*F. platypoda* A. Cunn. ex Miq.

d. subser. **Hesperidiiformes** Corner subser. nov.—Ut in subser. *Malvanthereae* sed bracteis basalibus 3 parvis, persistentibus. Typus—*F. hesperidiiformis* King.

2. ser. **Cyclanthereae** Corner ser. nov.—Anthera depresso-globosa, transversaliter dehiscentia. Ovarium in receptaculo semi-immersum, stigmate bifido. Receptacula magna, oblonga, bracteis 3 parvis subcaducis praedita. Typus—*F. sterrocarpa* Diels.

The stamen resembles that of *Brosimum alicastrum* Sw. and is unique in the genus.

sect. **Galoglychia** (Gasp.) Endl. Gen. Pl. 4, 2 (1847) 35.—*Galoglychia* Gasp. Parl. Giorn. Bot. 2 (1844) 217; Ann. Sci. Nat. ser. 3, 3 (1845) 346.—*Ficus* Linn. subgen. *Bibracteatae* Mildbr. et Burr. Engl. Bot. Jahrb. 46 (1912) 175.

This section was based on *F. galactophora* Ten. and *F. saussureana* DC., which are clearly African species of subgen. *Bibracteatae*, and possibly identical. In view of the great diversity of the Asiatic species of subgen. *Urostigma* and the parallel development of sect. *Malvanthera* compared with the African *Bibracteatae*, I cannot recognise this as a subgenus, and I treat the African group as a section of subgen. *Urostigma*.

sect. **Americana** Miq. Hook. Lond. J. Bot. 6 (1847) 525 (ut Americanae); Mildbr. et Burr. Engl. Bot. Jahrb. 46 (1912) 169.

This section is near both sect. *Urostigma* and sect. *Conosycea*, but it differs in the two, generally connate, basal bracts. The ovary has a red mark at the base and the cystoliths are generally amphigenous: thus the section is nearer to *Conosycea*. The species are entirely American.

sect. Urostigma

F. superba Miq. var. **alongensis** (Gagn.) Corner comb. nov.—*F. alongensis* Gagn. Lec. Notul. Syst. 4 (1927) 84.

This differs only in the small ovate-rotund lamina and short petiole, and it appears to be a xerophytic form.

F. superba Miq. var. **henneana** (Miq.) Corner comb. nov.—*F. henneana* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 216.—*F. gracilipes* Bailey, Dept. Agr. Brisb. Bot. Bull. 3 (1891) 16.—*F. parkinsoni* Hiern, J. Bot. (1901) 1.—*F. pritzelii* Warb. Fedde Rep. 1 (1905) 74. Except for the axillary position of the fig and, perhaps, the smaller leaves, I can find no distinction from *F. superba* which extends from Indo-China and Malaya along the Lesser Sunda Islands to Timor. Hence this may well be its state in Australia.

F. concinna Miq. var. **subsessilis** Corner var. nov.—*F. subpedunculata* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 217, 286 (haud 293).—Receptacula sessilia v. breviter pedunculata (0.5 mm.), bracteis basalibus caducis. N.E. India, Chekiang, Yunnan, Kwangtung.

Griffith 4589, 4590 (mixed with typical *F. concinna*); Henry 9122, 9965 (Yunnan); R. C. Ching 1917 (Chekiang, *typus*-herb. Kew.); F. A. McClure 280 (C.C.C. 64, 1961, Kwangtung); Bodinier 1027 (Macao).

At first perplexing, it is soon seen that, if there were a normal peduncle, these collections would belong to *F. concinna*. Ching 1917, McClure 280, and Bodinier 1027 are var. *concinna* with almost sessile fig. Griffith 4590 is the type of *F. subpedunculata* Miq.: it has sessile figs at Leiden, but normally pedunculate figs at Kew. Henry 9122 and 9965, as well as the Leiden specimen of Griffith 4590, have more coriaceous leaves with the veins not or scarcely raised above, and the lateral nerves at a wider angle. Henry 9122 has, also, a rounded to subcordate base to the lamina and approaches *F. cardiophylla* Merr. (fewer costas, longer basal nerves).

F. virens Ait. Hort. Kew. 3 (1789) 451.—*F. infectoria* Willd. sensu Roxb. Fl. Ind. 3 (1832) 551.—*Urostigma infectorium* Miq. Zoll. Syst. Verz. (1854) 90.—*F. infectoria* (Miq.) Miq. Ann.

Mus. Bot. Lugd. Bat. 3 (1867) 264, 286; King, Ann. R. Bot. Gard. Calc. 1 (1887) 60, pl. 75.—*F. lacur* auct., non vera.—This is the earliest name for the common banyan of India which has the articulate lamina, and which extends through Malaysia to Australia (*F. cunninghamii*) and to South Africa as the complex of *F. ingens* Miq. *F. virens* was based on a plant grown at Kew, of which there is a sterile specimen (the type) at the British Museum. This specimen is labelled *F. virens* Ait. in pencil and is one of a complete set of named specimens representing exactly those described by Aiton: hence there is no doubt of its validity. But Aiton referred it to the West Indies, evidently in the belief that it represented the plant figured as "Sloane Jam. 2 p. 140 t. 223" which is quoted after the description. The reference to Sloane's plant is, however, erroneous. Thus this name has been overlooked by students of Asiatic botany.

F. virens Ait. var. **sublanceolata** (Miq.) Corner comb. nov.—*F. saxophila* Bl. var. *sublanceolata* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 260.—*F. caulobotrya* (Miq.) Miq. var. *fraseri* Miq. id. 287.—*F. virens* has numerous leaf-forms, to which varietal names may be given, when they are better known, but I find so much variation in herbarium-material, even on the same specimen, that I have been unable to recognise any such categories. However, two varieties can usefully be distinguished on the fig, whether pedunculate or sessile. As the type of *F. virens* is a sterile sapling and there is no mention of the fig in the original description, it is necessary to adopt the earliest varietal name, but Miquel published simultaneously (1867) names for each variety. *F. infectoria* (Miq.) Miq. var. *aegeirophylla* (Miq.) Miq. refers to the pedunculate fig. while *F. saxophila* Bl. var. *sublanceolata* Miq. and *F. caulobotrya* (Miq) Miq. var. *fraseri* (Miq.) Miq. refer to the sessile fig. I propose to use the name var. *sublanceolata* Miq. for the sessile fig, and thus to take var. *virens* as representing the pedunculate fig. The decision is arbitrary, for both kinds occur in India and neighbouring countries, from whence the Kew-plant must have come.

F. virens Ait. var. **glabella** (Bl.) Corner comb. nov.—*F. glabella* Bl. Bijdr. (1825) 452.—This is the state with elliptic to obovate lamina, cuneate leaf-base, shorter petiole, and more or less sessile figs on short woody burrs on the twigs behind the leaves. It is the common state of the species in the rain-forests of Sundaland from lower Thailand and Sumatra to Borneo, where var.

virens and var. *sublanceolata* rarely occur and, then, chiefly on headlands and dry places. At the periphery of its range it grades into var. *sublanceolata*. Hence I cannot maintain it as a species.

F. caulocarpa Miq. var. **dasycarpa** Corner var. nov.—*F. argentea* Blanco sensu Merrill, Sp. Blanc. (1918) 129; Philip. J. Sci. 20 (1922) 368; Sata, Monogr. Ficus (1944) 216.—Receptacula et pedunculi dense albo-villosi: bracteis basalibus 1–1.5 mm. longis, glabris. Philippines (Luzon, Mindoro).

Bur. Sci. 39732 (Mindoro, Paluan); PNH 4788 (Luzon, Zambales prov., Mt. Pinatubo, *typus*—Manila).

This was identified by Merrill as *F. argentea* Blanco, which is a thoroughly dubious species, Merrill having first suggested that it was *F. ruficaulis* Merr. Neither fits Blanco's description.

F. prolixa Forst. f. var. **subcordata** Corner var. nov.—Lamina ovato-elliptica, ad basin cordata, subcordata, v. late cuneata, –15 × 8 cm.: nervis primariis utrinsecus 5–8, basalibus elongatis ¼–1/3 laminae: petiolo plus minus applanato. Ins. Caroline, Mariannas, Fanning.

Caroline Isl.—Fosberg 25479, E.Y. Hosaka 3231, (Ulithi Atoll). Mariannas—Fosberg 24972, 25004, 25112, (Rota); Fosberg 24731, 24758, Hosaka 2862, (Tinian); Fosberg 25221, 31278, 31791, Hosaka 2962, (Saipan); Anderson 123, 192, Fosberg 25302, 25331, 32620, 35333 (typus), 35515, 35518, 35630, 35631, (Guam); Fosberg 31684 (Alamagan); Anderson 508, 521, Fosberg 31392, (Pagan). Fanning—J.T. Arundel 14 (sterile, herb. Kew.).

This has the scattered male flowers of *F. prolixa,* though the more or less cordate leaf suggests *F. virens*. It is possible that the two species intergrade in the Carolines, where some collections (as Fosberg 25479) have so few scattered male flowers that the distinction seems trivial. Specimens with ovate-cordate leaves have not been recorded from the main range of *F. prolixa* in Polynesia.

F. hookeriana Corner nom. nov.—*F. hookeri* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 215, 286 (non Sweet, 1827).—This belongs in ser. *Orthoneurae*.

F. caulobotrya Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 287.—*Urostigma caulobotryum* Miq. Hook. Lond. J. Bot. 6 (1847) 568.—This is a mixture of leaves of *F. tsjahela* Burm. f. and figs of *F. arnottiana* Miq. Such is the state of the type-number (Wight 26) at Utrecht, Leiden, and Edinburgh (three sheets). It is clearly a *mixtum compositum* of mounting the material, and the name can be dismissed.

sect. Conosycea (Miq.) Corner subsect. Conosycea ser. Validae Miq.

F. arnottiana Miq. var. **subcostata** Corner v. nov.—Lamina subacuta vel obtusa. Receptacula 10 mm. lata, maturitate rubra: pedunculo 5–8 mm. longo. Cuticula circum stomata plicato-striata. Himalaya.

Duthie 23939 (Gahrwal); Gamble 23030 (Jehree); Polunin, Sykes, et Williams 4145 (Nepal, Melcham, c. 7000 ped. alt., typus—herb. Br. Mus.).

This has the larger fig and more striate leaf-cuticle of *F. costata* Ait. (*v. infra*), but the ovate-cordate lamina with few lateral nerves, prominent basal nerves, and long petiole of *F. arnottiana*. It lies outside the geographical range of both and, as an intermediate, needs further study. Compare, also, *F. glaberrima* Bl. var. *siamensis* Corner (*v. infra*).

F. costata Ait. Hort Kew. 3 (1789) 452.—*F. venusta* Kth. et Bouch. Ind. Sem. Hort. Berol. (1846) 16.—*F. caudiculata* Trim. J. Bot. 23 (1885) 243.—*F. mooniana* King, Ann. R. Bot. Gard. Calc. 1 (1887) 57, pl. 69.—*Urostigma wightianum* Miq. var. *majus* Thw. En. Pl. Ceyl. (1864) 265.

F. costata was said to come from the East Indies, and, according to Index Kewensis, from the Nicobar Islands. No such plant has since been recorded from the Nicobars, and I find that the type at the British Museum agrees in leaf, venation, and microscopic structure with *F. caudiculata* and *F. mooniana* of Ceylon. The type is clearly a sapling with large leaves and is sterile. There is also a specimen in the Herb. Martyn (Cambridge University Herbarium) named *F. costata* which agrees so well with the type that it may have come from the same plant cultivated at Kew. The cystoliths only on the upperside of the lamina, the plicate cuticle, and the upper hypodermal layer are distinctive microscopic characters in the Asiatic species of this alliance. *F. venusta* was said to have come from Cuba, but no such leaf has been found again in the Cuban flora and the type-specimen at Berlin agrees exactly with the specimen of *F. costata* at Cambridge.

There is some discrepancy, however, in the length of the petiole. In the type of *F. costata* the petiole is long, up to –9 cm., and the lamina is ovate-cordate to elliptic with subcordate base. The specimen in Herb. Martyn has the elliptic lamina with subcordate base but shorter petiole 1.2–5.5 cm. long. In *F. caudiculata* the lamina is elliptic with narrowly subcordate to cuneate base and short petiole 1.3–3 cm. long. But a specimen from Indo-China (Ch. d'Alleizette, environs de Tourane, 2.vi.09), which I cannot in

any way distinguish from *F. caudiculata*, has the petiole –7 cm. long. Further, King's plate of *F. mooniana* shows a petiole intermediate between the short petiole of *F. caudiculata* and the longer petiole. Hence I assume that the long petiole and ovate-cordate leaf must be the sapling form, which reduces to the elliptic leaf with subcordate to cuneate base and short petiole on the upper twigs of mature trees.

F. depressa Bl. Cat. Gewass. Buitzg. (1823) 35; Bijdr. (1825) 450.—*F. pruniformis* Bl. Bijdr. (1825) 451.—Blume confused this originally with specimens of *F. magnoliifolia* Bl., several sheets of which are named *F. depressa* in Blume's hand at Leiden. In 1825, he divided *F. depressa* into *F. pruniformis* Bl. and *F. magnoliifolia* Bl. without explanation. I reserve the name *F. depressa* in the sense of *F. pruniformis*. The type-sheets of all three species are well-preserved at Leiden, and that of *F. pruniformis* is identical with the lectotype of *F. depressa*.

F. globosa Bl. Bijdr. (1825) 449.—*Urostigma onustum* Miq., Hook Lond. J. Bot. 6 (1847) 575.—*F. onusta* Wall. ex Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 285.—The type-sheet in Herb. Hook at Kew consists of (*a*) two leaves and a twig with two figs of *F. pisocarpa* Bl. (= *F. microstoma* Wall. ex King), and (*b*) five leaves with two figs of *F. globosa* Bl. The sheet in the Wallich-herbarium at Kew is entirely *F. globosa* Bl. W. B. Hemsley wrote on the sheet in Herb. Hook. that Miquel's description corresponded with the *F. pisocarpa*-element. On studying Miquel's description, however, it is clear to me that he described the leaves of *F. globosa* and the figs of *F. pisocarpa*. Thus the species is a mixture, and I assign it to *F. globosa*.

sect. Conosycea (Miq.) Corner subsect. Conosycea ser. Drupaceae Corner

F. drupacea Thunb. Diss. Ficus (1786) 6,11.—*F. pilosa* Reinw. ex Bl. Bijdr. (1825) 446.—Examination of Thunberg's type has shown that this is the well-known *F. pilosa* from Java.

var. **auranticarpa** (Elm.) Corner comb. nov.—*F. auranticarpa* Elm. Leafl. Philip. Bot. 9 (1937) 3454.—Bracteis basalibus glabris 2–3 × 3–5 mm., non conditis. Luzon (Elmer 17186, typus), Celebes (Beccari s.n., Kandari: R. Ist. Fir. 9347, 9347A).

var. **glabrata** Corner v. nov.—Stipulae et nodi ultimi brunneopilosae, praeterea glabra. Bracteae basales 0.5–1 mm. longae, crescentiformes, margine ciliolato. Setae internae nullae v. sparsae. Malaysia, Ins. Solomon.

Kangeen Archipelago:—**Backer** 167, 26956, 27147, 29766 (det. *F. altissima*). Sumbawa:—Herb. Lugd. Bat. 293 (det. *F. annulata*). Soemba:—Iboet 103, 280 (det. *F. altissima*). Flores:—Elbert 4320. Alor:—O. Jaag 767, 892. Timor Laut:—Forbes 3371 (typus, herb. Br. Mus.). Solomon Isl.:—Guppy 116 (Shortland Isl.).

Glabrescent forms of var. *drupacea* have persistently brown hairy basal bracts.

var. **pedicellata** Corner v. nov.—Ut var. *glabrata* sed receptacula super bracteas basales pedicello 3–4 mm. longo praedita: setis internis brunneis, –1 mm. longis, copiosis. Nova Guinea (NGF 8557, Western Highlands, Jimmi Valley, Tagan River, 2400 ped. alt., typus herb. Lae).

F. cordatulae Merr. proximans.

var. **pubescens** (Roth) Corner comb. nov.—*F. mysorensis* Heyne ex Roth, et var. *pubescens* Roth, in Roehm. et Schult. Syst. Veg. 1 (1817) 508.—I cannot distinguish *F. mysorensis* from the large and varied complex of *F. drupacea*.

F. cucurbitina King var. **eubracteata** Corner v. nov.—Bracteae basales 5–7 × 10–13 mm., conspicuae, obtusae, glabrae v. marginibus ciliolatis. Ins. Philippines (PNH 14352, Samar, Catarman, Mt. Cansayo, typus herb. Manila).

In v. *cucurbitina* bracteae basales pusillae, 0.3–1 mm. longae, sub receptaculo conditae.

F. cordatula Merr. var. **sericea** (C. B. Robinson) Corner comb. nov.—*F. sericea* C. B. Robinson, Philip. J. Sci. Bot. 6 (1911) 319.—This is merely a form of *F. cordatula* with villous or tomentose twigs, stipules, and receptacles.

sect. Conosycea (Miq.) Corner subsect. Conosycea ser. Indicae Corner

F. benghalensis Linn. Sp. Pl. (1753) 1059; C. Hegard, Amoen. Acad. 1 (1749) 217; Miquel, Hook. Lond. J. Bot. 6 (1847) 571, 572; King, Ann. R. Bot. Gard. Calc. 1 (1887) 18, 19.—*F. indica* Linn. Sp. Pl. (1753) 1060; emend. Lamarck, Enc. Bot. 2, pt. 2 (1788) 494; Smith, Rees Cycl. 14 (1810) n.41; Roxburgh, Hort. Beng. (1814) 65; B. Hamilton, Tr. Linn. Soc. 13 (1822) 489; non sensu King, Ann. R. Bot. Gard. Calc. 1 (1887) 38, 40.—*F. cotoneaefolia* Vahl, En. Pl. 2 (1806) 189; non sensu Alston, The Kandy Flora (1938) 34.—*F. cotonifolia* Stokes, Bot. Mat. Med. 4 (1812) 355.—I have reduced *F. indica* Linn. to *F. benghalensis* Linn. because, as shown below,

they are synonymous. Roxburgh and Buchanan Hamilton long ago advised the converse, but their advice has never been accepted and to reinforce it now in view of the general agreement about *F. benghalensis* and the long current misuse of *F. indica* sensu King would be confusing. For this species, *F. indica* sensu King, I have substituted *F. sundaica* Bl. (*v. infra*).

The name *F. indica* comes from the great Indian banyan of ancient and mediaeval reference, namely "Ficus indica Theophrasti" (Tabern., Hist. p. 1370) and "Ficus indica foliis mali cotoneae . . ." (Bauhin, Pinax, p. 457). All this is explained by Cornelius Hegard. It can refer only to the species known as *F. benghalensis*, which is based on Rheede's description and illustration (Hort. Mal. 1, t.28, "Peralu"). Unfortunately, the poor wood-cuts of Clusius, Tabernaemontanus, and Bauhin, which showed a pointed and narrower leaf, lead the early botanists to suppose in their ignorance that there were two species of such great banyan in India, and the name *F. indica* Linn. was given to this fiction. Linneus believed that the banyan figured as "Katou-alou" by Rheede (Hort. Mal. 3, t. 57) represented this *F. indica* and cited it as well. King has shown, however, that Katou-alou is *F. mysorensis* Heyne, which I call *F. drupacea* Thunb. var. *pubescens* (Roth Corner (*v. supra*). Thus, the bad woodcut and the mis-reference of Katou-alou fostered the belief in two great Indian banyans.

Then, as *F. indica* var. β, Linneus (1753) gave "Tsiela" (Rheede, Hort. Mal. 3, t. 63) and references to American plants. In 1763 (Sp. Pl. ed. 2, 1514–1515), he added to var. β the "Varinga latifolia" of Rumphius (Herb. Amb. 3, t. 84). Lamarck perceived the error of including var. β under *F. indica*, and excluded it, thereby definitely emending *F. indica* as consisting of

(i) the references to Bauhin, Tournefort, Clusius, and Tabernaemontanus (= *F. benghalensis* Linn.),

(ii) Katou-alou of Rheede (= *F. mysorensis* Heyne),

(iii) Madagascan collections (? identification),

(iv) *F. vasta* Forsk.,

(v) A plant grown at Paris in the "Jardin du Roi" (which, according to the specimen in the Lamarckian herbarium, is *F. tsiela* Roxb.).

Of these five components, the first and second are elements of the original circumscription, but the second has since been excluded as *F. mysorensis;* the others must be excluded as erroneous. Hence one is back at the original definition which is to be identified with *F. benghalensis*. This was the opinion of King, but

he endeavoured to maintain the name for "Varinga latifolia" of Rumphius, though this was not part of the original circumscription and was definitely excluded by Lamarck. King's use is further complicated by his attempt to identify this Varinga latifolia.

The species, described and figured by King as *F. indica,* is a common strangling fig spread from Assam to Borneo. It does not occur in central India and it does not develop pillar-roots, as the great Indian banyan does, and hence it cannot be the *F. indica* of history. It does not occur, too, in the Moluccas, so it cannot be the "Varinga latifolia". Further, Rumphius described the fig as ellipsoid, which Lamarck noted, and which lead Merrill (Interpr. Rumphius Herb. Amb., p. 194) to identify "Varinga latifolia" with *F. gelderi* Miq. or *F. altissima* Bl., though neither of these occur in the Moluccas. Personally, I think that "Varinga latifolia" is the glabrescent state of *F. drupacea* Thunb. (*F. pilosa* Reinw.) which is common in the Moluccas, where Rumphius could hardly have missed it. Miquel had already given various names to the plant intended by King as *F. indica,* but the earliest name that I can find is *F. sundaica* Bl.

F. cotoneaefolia Vahl seems to have been intended as a new name for *F. indica* Lam., which is really *F. indica* Linn. emend. Lam., but the name was treated by King as a new species and so used by Alston. I base my conclusion on these considerations:—

(i) Vahl saw no specimen,

(ii) He cited merely the Asiatic references given for F. *indica* and var. β by Linneus in 1763, which are the Lamarckian references,

(iii) He cited Lamarck's emendation of *F. indica,*

(iv) He described *F. indica* Linn. six pages later (p. 195), basing his interpretation of it on the Linnean var. β, as shown by the citation of "Tsiela" of Rheede, "Varinga latifolia" of Rumphius,

(v) He seems to have been thoroughly confused for he also cited "Varinga latifolia" under *F. cotoneaefolia.*

Smith (1810) promptly recognised *F. cotoneaefolia* as superfluous and reduced it to *F. indica* Linn. In contrast, King interpreted *F. cotoneaefolia* by reference to "Katou-alou" of Rheede, which he showed to be *F. mysorensis,* and Alston substituted *F. cotoneaefolia* for *F. mysorensis.* There is, however, no evidence that "Katou-alou" was an essential part of the original circumscriptions of Linneus, Lamarck, or Vahl. Certainly they did not describe *F. mysorensis.* Further, as the specific epithet *indica* came from the early pre-Linnean authors, so *cotoneaefolia* clearly came

from Bauhin's "Ficus indica foliis mali cotoneae . . ." I conclude the Smith was right and that Katou-alou was merely an erroneous reference. A specimens in Vahl's herbarium is named "F. ? cotoneaefolia Vahl", but it is *F. tsiela* Roxb., which was also cited by Vahl under *F. cotoneaefolia* as "Tsiela" of Rheede. Lamarck, also, cited Tsiela under *F. indica*. This does not mean that they interpreted their species on Tsiela, but that they did not understand the banyans of India and tried to fit the species known to Rheede into the erroneous concept of *F. indica*.

F. pubilimba Merr. var. **ovata** Corner v. nov.—Glabra. Lamina 6–12 × 4–9.5 cm., ovata, breviter et obtuse subacuminata, basi cordato vel rotundato-subtruncato; costis basalibus 1/3–½ laminae elongatis. Malaya (Waterfall Gardens, Penang, leg. Flippance Oct. 1932, typus herb. Singapore).

This is known only from a single tree, still thriving, in the Penang Waterfall Gardens. The Province Wellesley Fig (Corner, Wayside Trees of Malaya, p. 680) is typical *F. publimba* Merr., which has the more or less elliptic leaf with cuneate base.

sect. Conosycea (Miq.) Corner subsect. Conosycea ser. Crassirameae Corner

F. stupenda Miq. var. **minor** Corner v. nov.—Ramuli 7–10 mm. crassi. Lamina 8–24 × 6–10.5 cm., basim versus rotundata v. late cuneata. Receptacula 30 × 22 mm., oblongo-ellipsoidea, bracteis apicalibus in discum planum 5 mm. latum instructis: bracteis basalibus 5–10 × 10–14 mm., obtusis. Flores minores, masculi 2–6 mm. longi. Johore, Singapore, Brunei, North Borneo.

Singapore:—Kelsall s.n., Chan Chu Kang, Nov. 1889; Goodenough 3399, Bukit Timah, Nov. 1887 (typus, herb. Singapore). Johore:—Sing. F.n. 37027, Mawai-Jemaluang Road, 17th mile, May 1940. Brunei:—Brun. 5325, Ulu Belalong. North Borneo:—Clemens 27132, Tenompok (ut *Artocarpus*); Elmer 21054, Tawao; For. Dept. A4712, Kinabatangan, Bt. Garam.

F. crassirameae Miq. proximans sed bracteis basalibus brevioribus et vix induratis.

F. crassiramea Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 286.—*Urostigma crassirameum* Miq. Pl. Jungh. (1851) 48.—*F. procera* Bl. var. *crassiramea* (Miq.) King, Ann. R. Bot. Gard. Calc. 1 (1887) 36, pl. 41.—*F. procera* auct., non vera.—As explained under *F. subtecta* Corner, *F. procera* Bl. has been mistakenly identified with *F. crassiramea* Miq., which is common and widely distributed in Malaysia.

var. **brevicupulata** Corner v. nov.—Receptacula 16–19 × 13–15 mm., subcylindrica, bracteis apicalibus in discum planum 4–5 mm. latum instructis; bracteis basalibus 5–7 × 7–12 mm., crassis, subcupulatis. Celebes, Obi.

Celebes:—Kjellberg 1300, Poehara, Moeara Sampara; 2245, Tabaramo. Obi:—Exp. v. Hulstyn 111 (typus, herb. Leiden).

var. **celebica** Corner v. nov.—Receptacula 27–28 × 20 mm., subcylindrica, bracteis basalibus 15–18 mm. longi. Celebes (Minahassa, Koorders 19126, 19160, et 19334, typus herb. Leiden).

var. **clementis** (Merr.) Corner comb. nov.—*F. clementis* Merr. Philip. J. Sci. Bot. 3 (1908) 130.—Receptacula 15–22 × 12–17 mm., bracteis basalibus 8–14 mm. longis. Ins. Philippine.

Clemens 421, 703 (typus); Elmer 10952; Merrill 1935; Bur. Sci. 19495: PNH 1985; Coll. Agr. Laguna 513, 547.

var. **patellifera** (Warb.) Corner comb. nov.—*F. patellifera* Warb. in K. Schum. et Laut. Nachtr. Fl. Schutzgeb. (1905) 241.—Receptacula 12–14 mm. lata, subglobosa, bracteis apicalibus in discum planum 3 mm. latum instructis; bracteis basalibus 5–8 × 10–15 mm. Nova Guinea.

Schlechter 14161, Ranu coast (typus, herb. Berlin); Kanehira et Hatusima 12838, Nabire, Neth. New Guinea; Brass 3857, Terr. N. Guinea, Central Div., Ononge Road, Dieni; Brass 24182, Milne Bay, Peria Creek; Brass 28085, Sudest Island, Rambuso; NGF 1723, Lae.

F. forstenii Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 214, 285.—*F. palawanensis* Merr. Govt. Lab. Publ. Philip. 29 (1905) 11.

var. **pacifica** (Elm.) Corner comb. nov.—*F. pacifica* Elm. Leafl. Philip. Bot. 9 (1937) 3460.

Lamina elliptico-obovata, breviter subacuminata, basi cuneato; costis basalibus 1/3–½ laminae elongatis. Malaya, Ins. Philippine.

Malaya:—King's Collector 6376 (Perak, Larut). Philippines:—Elmer 7460, 9370, 14463, 16401; Merrill 4032; Wenzel 3022; Bur. Sci. 26345, 76378; PNH 2050, 3673, 9066. (Elmer 14463, 16401, syntypes).

var. **umbobracteata** (Elm.) Corner comb. nov.—*F. umbobracteata* Elm. Leafl. Philip. Bot. 4 (1911) 1247.—Receptacula 25–32 × 18–22 mm., bracteis apicalibus gibbosis, bracteis basalibus 7–9 mm. longis. Mindanao (Elmer 11956 typus, 14117).

var. **villosa** Corner v. nov.—Ramuli, stipulae, petioli, laminae pagina inferior, bracteaeque basales pilis erectis (0.5 mm. longis) villosi. Receptacula 20–22 × 18–20 mm., bracteis basalibus 8–11 × 9–12 mm. Malaya, Borneo.

Malaya:—Corner s.n. Perak, Kroh, July 1936. Borneo:—Endert 3344, W. Koetai, pr. L. Petah (typus, herb. Leiden); For. Dept. B.N.B. A1073, Elopura, Sandakan; A3498, Lahad Datu, Kertam Kechil River; Sing. F.n. 19235, Banguey Isl.

F. subtecta Corner nom. nov.—*F. procera* Bl. Bijdr. (1825) 445, non Salisb. (1796).—*F. procera* Bl. has been consistently misidentified with *F. crassiramea* Miq. since King's monograph. Dried leaves of *F. procera* never show the characteristic shallow pitting of the areolae on the underside of the lamina as occurs in *F. crassiramea,* and there are constant differences in fig and venation. Blume's type is well-preserved at Leiden.

var. **depressa** Corner v. nov.—Receptacula 13–14 × 17–19 mm., depresso-globosa. Sumatra (Bünnemeyer 9089, G. Koerintji, typus herb. Leiden).

F. subgelderi Corner sp. nov.—Corner, Wayside Trees, Malaya (1940) pl. 208 (ut *F. indica*).—Arbor magna, epiphytica, suffocans, radicibus columnaribus deficiens; cortice albido-griseo; foliis subdistichis. Ramuli, petioli, stipulae, bracteae basales, et costae paginae inferioris pilis erectis brevibus sparsim puberuli v. subvillosi. Ramuli 3–5 mm. crassi. Lamina 4–16 × 1.5–7 cm., anguste obovata v. elliptica, acuminata, basi cuneato, rigide coriacea: costis lateralibus utrinsecus 3–6 (–7), intercostis 2–3 vix bene evolutis, subtus elevatis: costis basalibus utrinsecus 1, 1/3–½ laminae elongatis: petiole 5–32 mm. longo. Receptacula axillaria, binata, sessilia, maturitate e flava rubescentia, 13–16 × 10.5–13 mm., ellipsoidea v. breviter oblonga, bracteis apicalibus 2–3 in discum planum 3 mm. latum instructis: bracteis basalibus 6–7.5 × 7–8.5 late ovatis, obtusis, puberulis v. subtomentosis: setis internis nullis. Tepala 2 (mascula), 3 (feminea), libera, in floribus masculis et cecidiophoris valde indurata. Flores masculi sessilia v. breviter pedicellata: anthero angusto, valde exserto. Stomata superficialia. Malaya, Borneo.

var. **subgelderi.**

Malaya:—King's Coll. s.n., Perak; For. Dept. 12712, Ampang Reserve, Selangor; Derry 1211, Nyalas, Malacca; Kepong F. n. 71309, Kluang, Johore; Ridley s.n., Sept. 1890, et 5621, Bukit Timah, Singapore; Sing. F. n. 29224 (typus, herb. Singapore) et Ridley s.n., June 1898, Government Hill, Singapore.

Borneo:—Bur. Sci. (Manila) 1989, Sarawak; Brunei 226, S. Belait; H. Low s.n., 1867, Labuan (herb. Beccari, R.Ist. Fir.

9150A); For. Dept. B.N.B. 2323, Sandakan; Whitmore 583, Kalabakan, W. Tawao; Kostermans 4179, Balikpapan, S. Wain, et 6616, Samarinda, L. Djanan.

F. pellucido-punctatae Griff. (*F. gelderi* Miq) et *F. sundaicae* Bl. (*F. indica* auct.) persimilis sed ostiolo non pertuso, intercostis transversis satis distincta.

var. **rigida** Corner v. nov.—*Urostigma rigidum* Miq. Hook. Lond. J. Bot. 6 (1847) 578.—*F. rigida* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 286, non Jack (1822).—Folia spiraliter disposita. Glabra v. stipulae bracteaeque puberulae. Lamina 8–20 × 3–8 cm., basi subcordato v. cuneato: intercostis 3–8. Receptacula 10–14 mm. lata, globosa, plus minus depressa, disco plano 5 mm. lato praedita; bracteis basalibus 5–6 × 4–5 mm., v. 6–8 × 8–9 mm. Tepala vix indurata. Flores masculi bene pedicellati. Cambodia, Cochinchina, Thailand, Malaya, Sumatra, Java, Borneo.

Cambodia:—Poilane 14769, Nord Kampat. Cochinchina:—Fleury 29911, Mt. de Nui Chua Chang, prov. Bienhou; Poilane 21309, km. 58 route col. n. 20, prov. Bienhou; Poilane 21513, Dinh Quan, km. 46 route col. n. 20, prov. Bienhou. Thailand:—Kerr 2743, Ban Pe, Ragawang: Kerr 16558, Kawchang, Ranaung; Kerr 17440. Talang, Puket; J. Schmidt 140, Koh Chang (det. *F. consociata*); RFD 6232, Kaw Kut, Trat. Malaya:—Hb. Hook, Penang (typus *F. rigidae* Miq, et var. *rigidae* Corner); Philips s.n., 1824, Penang; Scortechini 194b, Perak; Wray 2530, Perak; Sing. F.N. 22344, Pahang; Sing. F.n. 23899, 30791, Sedili River, Johore; Wallich 4570E, Singapore (ut *F. longifolia* Ham. ined.). Sumatra:—Buwalda 6483, 6766, Indragiri; Grasshof 147, Lematang Oeloe; NIFS bb 22450; ?Teysmann 727, Batang Baroes. Java:—Koorders 9179, 9380, 20669, 23090, 24612, 38480, 38773, 38811, 39384; Forbes 530; Jacobs 4818; Bakh. v.d. Brink 6063; Korthals 39. Borneo:—Hewitt 6, Kuching.

F. paracamptophylla Corner sp. nov.—Valde scandens, foliis spiraliter dispositis, radicibus gracilibus pendentibus subsparsis, trunco –4 cm. crasso, haud suffocans. Glabra v. petiolo et laminae pagina inferiori puberula. Ramuli 5–9 mm. crassi. Stipulae 10–80 × 9–20 mm., brunnescentes, oblongo-lanceolatae, persistentes. Lamina 10–26 × 3.5–9.5 cm., oblongo-elliptica, subacuminata v. breviter et acute acuminata, ad basim subcordata v. cuneato-rotundata, valde coriacea: costis lateralibus utrinsecus 6–9, subtus vix elevatis, intercostis 1–4, saepe subscalariformibus: costis basalibus utrinsecus 1 (–3), ¼–½ laminae elongatis: petiolo 15–30 × 3–6 mm., sicco fusco-brunneo. Receptacula axillaria, sessilia, binata, 13–16 × 13–17 mm.

(vivo, 20–25 mm.), ellipsoidea v. subconica, bracteis apicalibus 3 in discum planum 3–5 mm. latum, haud perforatum, instructis: bracteis basalibus 4–7 × 5–9 mm., obtusis v. subacutis, appresse puberulis. Flores masculi copiosi, tepalis 2. Flores cecidiophori pedicellati, tepalis 2–3; feminei sessiles, tepalis 3. Borneo, in silvis inter arbores insinuans, haud rara.

F. acamptophyllam Miq. simulans sed major, stipulis non caducis, receptaculi apice non pertuso.

Anderson 9092, Sarawak, Bau, Seburan, et 9103, Semengoh Forest (typus, herb. Kuching); Corner s.n. Sarawak, Bako National Park; Brunei 5323, Ulu Temburong; Kostermans 4027, Balik Papan; Main (Exp. Polak) 2119, Indonesian Borneo, Pulow, Kudala tas Djonkong; Nieuwenhuis 1425, Indonesian Borneo, Bloe-oe; Sinclair 9352, Sandakan, Sepilok Forest.

sect. Conosycea (Miq.) Corner subsect. Dictyoneuron Corner ser. Glaberrimae Corner

F. glaberrima Bl. var. **bracteata** Corner v. nov.—*F. travancorica* King, Ann. R. Bot. Gard. Calc. 1 (1887) 28.—*F. lawesii* King, J. As. Soc. Beng. 55 (1887) 403.—*F. adamii* Elm. Leafl. Philip. Bot. 4 (1911) 1258 (ut *F. adamsii* laps. cal.).—*F. villamilii* Merr. ex Sata, Monogr. (1944) 183.—Bracteae basales (ad apicem pedunculi) 0.5–1.5 mm. longae, crescentiformes: bracteae apicales saepe incrassatae. Flores cecidiophori plerumque sessiles. India, Borneo, Philippines (Luzon, Mindanao), Nova Guinea.

India:—Barber 6006, Anamalais; Beddome 7509. Travancore. Borneo:—Kostermans 4918, E. Koetai, Sangkulirang Isl.; Purseglove 5183, Sarawak, S. Mayeng, Tau range. Philippines:—Bur. Sci. 22821, 28100; Elmer 11177, 14029, 18284; For. Bur. 26361; PNH 9480, 10623; Coll. Agr. Laguna 510. New Guinea:—Aet et Idjan 738, 843, Jappen-Biak; Docters v. Leeuwen 10055, Rouffaer River; Forber 85, Sogeri; Hoogland 3748, Terr. N. Guinea, Northern Div., Garara, Popondetta-Cape Killerton Road (typus, herb Lae); Hoogland 4634, North Div., Tufi subdistr., Budi; NGF 5216, 7423, Morobe, Bulolo; NGF 9067, Lae.

Var. *glaberrima* has no basal bracts. The so-called figs of *F. lawesii* (Forbes 85) are abnormal galls.

var. **siamensis** Corner v. nov.—Lamina 5–9.5 × 3–7.5 cm., late elliptica, breviter acuminata, basi rotundato v. subcordato: costis lateralibus utrinsecus 5–9, intercostis 1–4 vix distinctis: costis basalibus haud elongatis: petiolo 10–30 mm. longo. Receptacula 8

mm. lata, peduculo 10–15 mm. longo: bracteis basalibus 3, 1–2 mm. longis, obovatis, subacutis, caducis: bracteis apicalibus parvis, gibbosis. Cuticula circum stomata et cystolitha plicato-striata. Thailand, in collibus calcareis.

Kerr 2428, Hin Hap, Saraburi (typus, herb. Br. Mus.); Kerr 3021, Kao Sung, Paknampo; Kerr 9756, Krabin, Kao Sakan; Nielsen 651, Koh Sichang.

This needs more collection because it may be a new species. It relates *F. arnottiana, F. costata,* and *F. glaberrima.* It has the short basal nerves, short petiole, and the fig of *F. glaberrima,* but the apical bracts, the caducous basal bracts, the rounded subcordate leaf-base, the tendency to intercostal veining, and the striate cuticle of *F. arnottiana.* From *F. costata* it differs in the short lamina with few lateral nerves and intercostals, the small fig with caducous basal bracts, and the less plicate cuticle. The three species suggest an ancient complex of the Asiatic mainland.

sect. Conosycea (Miq.) Corner subsect. Dictyoneuron Corner ser. Validae (Miq.) Corner

F. sundaica Bl. Bijdr. (1825) 450.—*F. indica* sensu King, Ann. R. Bot. Gard. Calc. 1 (1887) 39, pl. 45.—This is, as King suggested, the same as the species for which he sought to maintain the name *F. indica* Linn. (see *F. benghalensis,* above). Blume's specimen is sterile but the venation and sunken stomata leave no doubt: further, this common *Ficus* is not represented among others of his from Java.

var. **beccariana** (King) Corner comb. nov.—*F. korthalsii* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 215, 286.—*F. korthalsii* Miq. var. *beccariana* King, Ann. R. Bot. Gard. Calc. 1 (1887) 23, pl. 35A.—This variety is distinguished by the oblong or obovoid fig with more unbonate disc of apical bracts. It often has a shorter leaf and, when sterile, may be impossible to distinguish from *F. pellucido-punctata* Griff (*v. infra*). Intermediates with *v. sundaica* occur.

F. lowii King var. **borneensis** Corner v. nov.—Receptacula minora, 13–14 mm. lata, haud umbonata, bracteis apicalibus in discum planum 3 mm. latum instructis. Lamina minus coriacea, costis ad paginas ambas leviter elevatis, costis basalibus ¼–1/3 laminae elongatis. Glabra. Borneo (Kostermans 9758, G. Mentawir, Balik Papan; typus, herb. Bogor).

var. **minor** Corner v. nov.—Receptacula 10 mm. lata, haud umbonata, bracteis apicalibus in discum planum 3 mm. latum instructis. Ramuli et stipulae pubescentes. Lamina rigide coriacea

costis basalibus 1/3–½ laminae elongatis. Malaya (Ridley 16176, Wray's Camp, G. Tahan, Pahang, typus herb. Singapore).

F. lowii is a rare species of Perak and these two collections indicate that it must have a greater range and variability in the mountains.

F. sumatrana Miq. var **circumscissa** Corner.—*F. acamptophylla* sensu King, Ann. R. Bot. Gard. Calc. 1 (1887) 40, pr. p. Kunstler.—Stipulae dense sericeae v. subtomentosae. Lamina rigide coriacea, valde acuminata. Receptacula 8–10 mm. lata, plus minus depresso-globosa, circum discum apicalem (2–3 mm. latum) irregulariter circumscissa. Malaya.

Perak:—For. Dept. 39338, Piah For. Res.; Kunstler 4055 (Larut), 6106 (Gopeng), 10922 (Ulu Bubong); Ridley 10264, Dindings; Wray 3788, Upper Perak. Trengganu:—Sing. F.n. 30357 (typus, herb. Singapore) et 30713, Bt. Kajang, Kemaman. Johore:—Sing. F. n. 29937, Sedili River.

Haud *F. acamptophylla* Miq, forsan species nova.

var. **microsyce** Corner v. nov.—Receptacula parva, 4–6 mm. lata (5–7 mm., vivo), disco apicali 2 mm. lato, bracteis basalibus 1.5–3 × 2–3 mm. Malaya, Sumatra, Java, Borneo, Celebes, Philippines.

Malaya:—Curtis 3515, Pangkor, Perak; Ridley 13478, Sedenah, Johore; Sing. F.n. 32241, Sedili River, Johore (typus, herb. Singapore). Sumatra:—Bangham 804, L. Tawar. Java:—Zollinger 1225. Borneo:—Endert 3216, W. Koetai; Clemens 26827, 26828, Kinabalu; For. Dept. B.N.B. A4703, 10119, Kinabatangan. Celebes:—Kjellberg 733, Kendari, Poehara. Philippines:—Elmer 12386, Sibuyan (det. *F. indica*); Williams 226, Lamao River; Coll. Agr. Laguna 611, Mt. Makiling.

F. binnendykii Miq. similis sed receptaculis non pertusis.

var. **subsumatrana** (Gagnep.) Corner comb. nov.—*F. subsumatrana* Gagnep. Lec. Notul Syst. 4 (1927) 96.—Receptacula 7–10 mm. lata, bracteis basalibus 4–7 (–9) × 5–8 mm. semitecta, disco apicali 3–4 mm. lato. Indochina, Malaya, Sumatra, Borneo.

Annam:—Poilane 1294 et 10786 (syntypes), 22415, 24034, 24159, 24475, 24487, 24605, 24670, 24683. Cochinchina:—Poilane 19523. Malaya:—Burn Murdoch s.n., Feb. 1904, Semangko Pass, Selangor. Sumatra:—Lorzing 5451, Sibolangit (det. *F. indica*). Borneo:—Hallier s.n., Liang Gagang (Herb. Hort. Bot. Bog. 3065); Kostermans 6994, Samarinda.

F. binnendykii Miq. var. *cupulata* Corner (*v. infra*) similis, sed receptaculis non pertusis.

F. delosyce Corner sp. nov.—Arbor magna, epiphytica, suffocans, cortice brunneo-carneo, foliis subdistichis, glabra v. receptaculis puberulis. Ramuli 1–3 mm. crassi. Stipulae breves. Lamina 2.5–8.5 × 1.2–4 cm., elliptica, raro obovata, subacuta v. breviter acuminata, basi cuneato, tenue coriacea: costis lateralibus utrinsecus 3–5, intercostis nullis, basalibus 1 et 1/3–½ laminae elongatis: petiolo 6–13 mm. longo, gracili. Receptacula axillaria, binata, sessilia, 7–14 × 6–8 mm., ellipsoideo-fusiformia, saepe sparsim puberula, bracteis apicalibus subconicis: bracteis basalibus 2–3.5 × 2–2.5 mm., ovato-oblongis, subacutis, angustis: setis internis nullis. Tepala 2 v. 3, libera. Flores sessiles v. pedicellati.

var. **delosyce**

Malaya, Brunei, in silvis paludosis.

Singapore:—Sing. F.n. 37364, McRitchie Reservoir. Johore:—Sing. F.n. 21337, 28178, 28607, (typus, herb. Singapore), 36800, Sedili River; Ridley 13267, Tempayan River. Selangor:—Sing. F.n. 30774, Pengkalan Kempas; 34033, Telok Reserve; 34143, S. Tinggi; Burkill 1020, S. Buloh; Cons. For. 4870, Kuala Lumpur. Negri Sembilan:—Ridley s.n., G. Angsi, Feb. 1904. Brunei:—S5858, Seria; Brun. 5375, S. Belait.

var. **obtusa** Corner v. nov.—Lamina rotundato-obtusa. v. subacuta. Borneo.

For. Dept. B.N.B. 2449, A3286, A3581, Sandakan; 4319, Tawao; Kostermans 5681, Indonesian Borneo, E. Koetai, S. Susuk (typus, herb. Bogor).

F. spathulifoliae Corner (*v. infra*) affinis sed costis paucis, receptaculis ellipsoideo-fusiformibus, bracteis basalibus parvis distincta.

F. spathulifolia Corner sp. nov.—Arbor mediocris, epiphytica, vix suffocans, glabra v. stipulis puberulis, foliis spiraliter dispositis. Ramuli 3–5 mm. crassi. Stipulae breves. Lamina 4–8 × 2–4 cm., anguste obovata v. spathulata, obtusa v. obtuse subacuminata, basi cuneato, rigide coriacea, crassiuscula: costis lateralibus utrinsecus 3–7, vix conspicuis, intercostis nullis: costis basalibus utrinsecus 1, ¼–½ laminae elongatis: petiolo 8–15 × 2–2.5 mm., applanato. Receptacula axillaria, binata, sessilia, 6–8 × 6–7 mm., subglobosa v. subobovoidea, umbonata, bracteis apicalibus 2 obtusis in discum convexum 3 mm. latum instructis: bracteis basalibus 3–4 × 4–5 mm., ovatis, obtusis: setis internis nullis. Tepala 2–3, libera. Flores masculi pedicellati, feminei et cecidiophori sessiles.

var. **spathulifolia**

Malaya (Selangor), Sarawak, Brunei, in silvis paludosis. Selangor:—Sing. F.n. 33970, Bt. Changgang, Klang (typus, herb. Singapore); 34022, Telok Reserve, Klang. Sarawak:—Anderson 9044, 9232, Binatang: W. M. A. Brooke 8778, Kelepu: Bur. Sci. 239; For. Dept. 7933, 8008, S. Kelepu, P. Bruit; Sing. F.n. 35686, Manga Temulan. Brunei:—S5862, Seria.

var. **annamensis** Corner v. nov.—Ramuli 2–3 mm. crassi. Lamina –10 × 5.2 cm., acuminata, apice subacuto: costis lateralibus utrinsecus 4–6. Bracteae basales minores, 1.5–2 × 2–3 mm. (–3 × 4 mm., Poilane 23462). Tepala mascula praesertim 2. Annam, in silvis monticolis.

Poilane 22104, 22142 (typus, herb. Paris), 23462, 23749, prov. Haut-Douaii, 1,000–1,200 m. alt.

var. **substipitata** Corner v. nov.—Ut v. *spathulifolia* sed receptaculis breviter pedicellatis, bracteis basalibus 1.5–2.5 mm. longis pedicellum obscurantibus. North Borneo.

For. Dept. B.N.B. A440, Sandakan (typus, herb. Kew); A1567, Tawao.

Species lamina parva obtusa paucinervosa, receptaculis parvis umbonatis, valde distincta, sed in v. *annamense F. delosyce* Corner approximans.

F. maclellandi King var. **rhododendrifolia** Corner v. nov.—*F. rhododendrifolia* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 286, non Kunth et Bouch. (1847).—Glabra, raro lamina in juventute laxe pilosa. Bracteae basales 3, 2–3 mm. longae, vix conditae. Himalayas, Khasia, Chittagong, North Burma, Pegu, Yunnan, in silvis monticolis.

India:—Brandis s.n., W. Duars; G. Mann s.n., Assam; Masters s.n., Assam (typus, herb. Kew); Hooker s.n., Khasia et Chittagong; Schlick s.n., Khasia. Burma:—K. Ward 20427, Sumpra Bum (det. *F. benjamina*); Kurz 3135, Pegu. Yunnan:—Y. Tsiang 12332.

A var. *maclellandi* vix distincta sed adhuc raro collecta.

F. calcicola Corner sp. nov.—Arbor parva, epiphytica v. terricola, foliis laxe spiraliter dispositis. Ramuli, petioli, stipulae, costarum mediarum partes inferiores, bracteaeque basales pilis brunneis piloso-tomentosi. Ramuli 2–3 mm. crassi. Stipulae –5 mm. longae. Lamina 5–13 × 2.7–5.5 cm., elliptica v. obovata, breviter et obtuse v. subacute acuminata, basi cuneato, coriacea: costis lateralibus utrinsecus 5–7 (–8), vix elevatis, intercostis transversis 2–5: costis basalibus utrinsecus 1, ½–1/3 laminae

elongatis: petiolo 7–22 mm. Receptacula axillaria, binata, sessilia, 7–10 mm. lata, subpyriformia v. subglobosa, glabra, bracteis apicalibus subprojicientibus in discum 2 mm. latum instructis: bracteis basalibus 1–2.5 mm. longis, ovatis, acutis, appresse brunneo-pilosis: setis internis paucis, brunneis, v. nullis. Tepala 3, raro 2 in floribus masculis vel 4 in femineis. Flores masculi sparsi, breviter pedicellati, cecidiophoris breviores. Burma, Thailand, Malaya, in collibus calcareis.

Malaya:—Burkill 6283, Tambun, Ipoh; Ridley 8518, 15th mile Pahang track, Selangor; Kepong F. n. 37426, Kanching, Selangor; Sing. F.n. 34388, Kanching (typus, herb. Singapore). Thailand:—Kerr 130, 2394, Saraburi; 240, Prachuap; 2498, Sam Roi Yawt; 11376, Chumpawn; 19843, Krabin; Marcan 1738, Ratburi. Burma:—Abdul Hak 22, Upper Burma, det. *F. nitida.*

F. microcarpae similis, sed pilis brunneis intercostisque differt: forsan *F. maclellandi* affinis.

F. retusa Linn. Mant. (1767) 129; J. E. Smith, Rees Cycl. 14 (1810) n. 62.—*Urostigma retusum* (Linn.) Miq. Hook. Lond. J. Bot. 6 (1847) 581.—*U. truncatum* Miq. Zoll. Syst. Verz. (1854) 91, 97.—*F. truncata* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 262, 286, non Vahl; King, Ann. R. Bot. Gard. Calc. 1 (1887) 41, pl. 48.—This name has been erroneously used for *F. microcarpa* Linn. f. (*v. infra*). The type of *F. retusa* in the Linnean herbarium, represented by a single good specimen, is without doubt the species known as *F. truncata* Miq. Linneus ascribed the specimen to India, where the species does not occur, but there is no locality on the sheet, and the specimen agrees exactly with the Javanese state of *F. truncata;* hence, I assume that it must have come from Java. As *F. truncata* is a later homonym, a new name must be found for it and the only solution is to accept this disagreeable discovery.

var. **borneensis** Corner v. nov.—Lamina acute acuminata, tenue v. valde coriacea, costis superne valde impressis, inferne prominentibus: costis lateralibus utrinsecus 6–8, basalibus vix elongatis. Bracteae basales 3–5 × 3–7 mm., 1/3–½ receptaculi obscurantes. Tepala 2–3. Borneo, in silvis frequens.

Hallier 1020b, 1074, S. Sambas (1074, typus, herb. Leiden); Kepong F.n. 80258, Beaufort, North Borneo; Main 1930, Danu Pontoelok; Meijer 2463, 2582, Tarakan; Teysmann 7122, Blitong; Corner s.n., 1959, Kuching.

A speciminibus javanicis varietatis *retusae* valde distincta, sed malayana intermedia.

sect. Conosycea (Miq.) Corner subsect. Dictyoneuron Corner ser. Perforatae Corner

F. pellucido-punctata Griff. Notul. 4 (1854) 394; Ic. Pl. As. 4 (1854) t. 554. Syn.—*F. gelderi* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 216, 287.—*F. indica* Linn. var. *gelderi* (Miq.) King, Ann. R. Bot. Gard. Calc. 1 (1887) 39, pl. 45.—Griffith's description and illustration of the ellipsoid fig with umbilicate and half-open orifice shows that it is the same as *F. gelderi*. It is represented at Kew by Griffith 4636, named *F. pellucido-punctata* Griff., but of uncertain origin. Griffith gave Assam (Gowahatti) in his description, but the species has not been collected again from Assam. Herb. Helfer 4636 (Tenasserim and Andamans), also named *F. pellucido-punctata,* is *F. sundaica* Bl. (= *F. indica* Linn. sensu King).

F. episima Corner sp. nov.—*F. pellucido-punctatae* affinis, sed lamina disimillima. Ramuli 3–3.5 mm. crassi. Stipulae –20 mm. longae. Lamina 6–10 × 3.2–6 cm., elliptica v. obovata, apice obtuse rotundato v. subacuto, basi cuneato, rigide coriacea, crassiuscula: costis lateralibus utrinsecus 3–5, basalibus ½–2/3 laminae elongatis: petiolo 12–20 mm. longo. Receptacula axillaria, binata, sessilia, –15 × 12 mm., late ellipsoidea, subtruncata, ostiolo pertuso: bracteis basalibus 3–4.5 mm. longis, ovatis, subacutis. Mindanao.

Elmer 11314, Mt. Apo (det. *F. retusa*); PNH 10045, Mt. Katanglad, Bukidnon; 10269, Surigao (typus, herb. Manila).

F. pisocarpa Bl. Bijdr. (1825) 454.—*F. microstoma* Wall. ex King, Ann. R. Bot. Gard. Calc. 1 (1887) 38, pl. 44.—This uncommon species of Lower Thailand, Malaya, Java, and Borneo, is close to *F. pellucido-punctata.* There is no specimen named *F. pisocarpa* by Blume at Leiden, but there are three which he must have seen, namely one collected by Reinwardt, another by Blume himself, and the third labelled "H.L.B. 43 Gedeh", which is the type-locality of *F. pisocarpa.* These sheets were un-named, but they are the same as *F. microstoma,* which fits well with Blume's description, particularly "fructibus pisiformibus . . . sessilibus plano-umbilicatis". No other Javanese banyan fits this description and, as *F. microstoma* is the one species as yet unaccounted for among Blume's names, I have no hesitation, after working through the Malaysian banyans, in identifying it with *F. microstoma.*

King misinterpreted *F. pisocarpa* by identifying it with Kunstler 3555, which is *F. caulocarpa* Miq, having stipitate figs, not plano-umbilicate, and different leaves.

F. binnendykii Miq. var. **coriacea** Corner v. nov.—*Urostigma tjiela* Miq. Hook. Lond. J. Bot. 6 (1847) 580, pr. p. Cuming 1931.—Lamina 4–11 × 2–5 cm., anguste v. late elliptica, lanceolata, rigide coriacea, crassiuscula, venis obscuris: costis lateralibus utrinsecus 3–5, basalibus 1/3–½ laminae elongatis. Bracteae basales 2.5–4 mm. longae. Annam, Malaya, Bangka, Sarawak, Brunei, Luzon.

Annam:—Poilane 32798, Nui Dai Ding, prov. Koutum. Malaya:—Singapore, Burkill 2031, Langlasse 313, 328, Ridley 3402, 5639, 5640, 6459, 9219, 10382, 10808, 12203, 14155, Sinclair 4917, Sing. F.n. 33560; Johore, Ridley 12162, 13267, Sing. F.n. 36562; Malacca, Cons. For. 2061; Perak, Cons. For. 2313, King's coll. 6106, 10505, Scortechini 310, 322, 1051, Sing. F.n. 31655 (typus, herb. Singapore). Bangka:—Kostermans et Anta 172, 534, 1076. Sarawak:—Clemens 22318, Mt. Matang. Brunei:—Brun. 542, Andulau. Luzon:—Bur. Sci. 22275, Cuming 1931.

F. sumatranae persimilis sed ostiolo pertuso, bracteis basalibus parvis.

var. **cupulata** Corner v. nov.—Ut. var. *binnendykii* sed bracteae basales 4–6 × 5–8 mm., 1/3–½ receptaculi obscurantes. Lamina plus minus coriacea. Celebes.

Kjellberg 2769, Matano (typus, herb. Stockholm); 2823, Sorvako.

var. **latifolia** Corner v. nov.—Ut var. *binnendykii* sed lamina 6–13 ×4–6.5 cm., late elliptica v. ovato-elliptica, basi rotundato v. late cuneato: costis lateralibus utrinsecus 3–4. Borneo.

Beccari 3353, Pontianak, det. *F. cycloneura* (typus, herb. Florence); San. 17172, Tawao; Teysmann 7111, Kapoeas, det *F. cycloneura.*

sect. Conosycea (Miq.) Corner subsect. Benjamina Miq. ser. Benjamineae Miq.

F. subcordata Bl. Bijdr. (1825) 440.—*F. garciniifolia* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 218, 287.—*F. calophylloides* Elm. Leafl. Philip. Bot. 4 (1911) 1246.—*F. acrorrhyncha* Summerh. J. Arn. Arb. 13 (1932) 98.—*F. fairchildii* Backer, Blumea 6 (1947–8) 306.—*Urostigma balicum* Miq., *U. subcordatum* (Bl.) Miq. Fl. Ind. Bat. I, 2 (1859) 348, 349.—This is an uncommon, but wide-spread, species from Tonkin to New Hebrides, yet I can see but slight differences in the size of leaf and fig in the collections (35 in all), and I have compared the types. Reinwardt 1338 (Timor) is the original *F. subcordata* Bl., labelled "arbor elegans ante domum in villa Koepang

Timoriensium". The specimen at Utrecht is labelled "F. subcordata. Timor" by Reinwardt; that at Leiden is labelled both by Blume and Miquel and bears the note "Zipp. ?". Both are sterile, but the venation, cystoliths, and sunken stomata clinch the identity with *F. garciniifolia*, the type of which also came from Timor (de Vriese, Koepang).

var. **malayana** Corner v. nov.—Receptacula majora, 35–50 × 20–25 mm., subcylindrica: bracteis basalibus annulato-conjunctis, annulo 0.5–1 mm. lato, integro vel obscure sublobato. Flores masculi pauci, pedicellis 1.5–5 mm. longis. Malaya, North Borneo.

Malaya:—Curtis s.n., May 1902, road to Gap, Selangor (typus, herb. Singapore); For. Dept. 6547, Kampong Bahru, Kuala Lumpur. Borneo:—San. 4365, Mt. Trus, Keningau distr.

F. benjamina Linn. var. **bracteata** Corner v. nov.—Bracteae basales 2–3 × 2.5–4 mm., haud conditae. Cochinchina, Celebes, Morotai, Sumbawa, Timor, Philippines, New Guinea, New Britain.

Cochinchina:—Poilane 17349, Budop. Celebes:—Kjellberg 1386 (Eurekang), 1669 (Makule), 2290 (Timampoe). Morotai:—Kostermans 780, 807, 1514. Sumbawa:—Elbert 3997, 4087. Timor:—Forbes 3796. Philippines (Luzon, Negros, Batan, Mindoro):—Bur. Sci. 80168, 80300; Coll. Agr. Laguna 508, 557, 568; Cuming 1936; Elmer 10153 (det. *F. indica*), 16038; PNH 9482, 16897, 33342; Wenzel 1411, 1470. New Guinea:—Brass 21616, 21902; Carr 16359 (typus, herb. Br. Mus.); Doctors v. Leeuwen 9534; Hoogland 4167, 4269. New Britain:—NGF 7038.

sect. Conosycea (Miq.) Corner subsect. Benjamina Miq. ser. Callophylleae Corner

F. callophylla Bl. var. **leytensis** Corner v. nov.—*F. pachyphylla* Merr. Philip. J. Sci. Bot. 8 (1913) 365, non King (1887).—Receptacula obovoidea, bracteis apicalibus in umbonem acutum instructis, bracteis basalibus 7–9×7–8 mm. acutis. Leyte (Wenzel 209, typus varietatis etiam *F. pachyphyllae* Merr.).

var. **malayana** Corner v. nov.—Lamina saepe major, valdius coriacea, venis quasi obscuratis. Receptacula majora, 14–17 × 15–20 mm., bracteis basalibus 8–10 × 7–12 mm. Tepala mascula (3–)4. Thailand, Malaya, Sumatra.

Thailand:—J. Schmidt 537; G. Seidenfaden 2079. Malaya:—Hullett 329; King's coll. 4697. Sing. F.n. 21190 (typus, herb. Singapore), 28634, 28657, 31662, 34144, 34460, 34464, 36955, 37987. Sumatra:—Forbes 1735, 2590.

var. **minor** Corner v. nov.—Receptacula minora 7–8 × 7–10 mm., bracteis basalibus 3–4 mm. longis. Celebes, Sumbawa.

Celebes:—Boschproefst. Cel/III–22, Cel/IV–114 (typus, leg. 27.VIII.32, herb. Leiden), Malili; Koorders 19199, 19329, 19337, Minahassa (det. *F. retusa*); Teysmann 12142, Pangkadjena. Sumbawa:—Elbert 3689.

F. curtipes Corner nom. nov.—*F. obtusifolia* Roxb. Fl. Ind. 3 (1832) 546, non HBK; King, Ann. R. Bot. Gard. Calc. 1 (1887) 42, pl. 49.

F. tristaniifolia Corner sp. nov.—Arbor mediocris, epiphytica, vix suffocans, foliis spiraliter dispositis, glabra. Ramuli 3–5 mm. crassi. Stipulae –22 mm. longae. Lamina 4.5–10.5 × 1.5–5 cm., anguste obovata v. spathulata, apice obtuso subtruncato v. subretuso, basi anguste cuneato, valdissime coriacea, crassiuscula, marginibus recurvis, sicco ferruginea, venis quasi obscuratis: costis lateralibus utrinsecus 7–9, obliquis, secundariis vix minus evolutis: costis basalibus utrinsecus 1, 1/3–½ laminae elongatis: petiolo 5–12 × 2 mm., brevi, applanato. Receptacula axillaria, binata, sessilia, 8–10 mm. lata, subglobosa, bracteis apicalibus 2 in discum planum 2 mm. latum instructis: bracteis basalibus 3–5 mm. longis, 1/3–½ receptaculi obscurantibus; setis internis nullis. Tepala 3, libera. Flores masculi et cecidiophori pedicellati, feminei sessiles. Malaya, Sumatra, Borneo, in silvis paludosis rara.

Malaya:—Ridley 1597, Malacca, S. Udang; Sing. F.n. 36606, 36698, Johore, Pontian, Penkalan Raja (36698 typus, herb. Singapore). Sumatra:—Bruinier 306, East Coast, S. Rawa. Borneo:—Buwalda 7852, Sampit; NIFS bb. 32411, Sampit; v. Romburgh 11, Paloh.

F. spathulifolia Corner (*v. supra*) facile confusa, sed foliis valdius coriaceis, venis ut in *F. callophylla*, receptaculis haud umbonatis.

F. microcarpa Linn. f. Suppl. Spl. Pl. (1781) 442.—*F. retusa* auct., *F. nitida* auct., *F. retusa* var. *nitida* auct., non verae.—This is the plant generally, but wrongly, called *F. retusa*, *F. nitida*, or *F. retusa* var. *nitida*. *F. retusa* Linn. is the species generally called *F. truncata* Miq. (*v. supra*), while *F. nitida* Thunb. is *F. benjamina* Linn., and *F. benjamina* sensu Thunb. is this *F. microcarpa*. I have disentangled the confusion by study of the types and original specimens. *F. microcarpa*, strangely enough, never reached Carolus Linneus. The name-change is

jarring, for this is one of the more widely cultivated species, but in the absence of Nomina Specifica Conservanda aut Rejicienda there is no way out. It ranges from Ceylon, India, South China, and Ryu Kyu islands to Australia and New Caledonia.

var. **microcarpa** f. **pubescens** Corner f. nov.—Stipulae et bracteae basales dense appresse puberulae. Ramuli et receptacula subvillosa. Thailand, in collibus calcareis.

Kerr 2168, Chawng Ke, N. Sawan (typus, herb. Br. Mus.); 10649, Chawn Bung, Rotburi; Kostermans 681, Kwae Noi Basin Exp., Brongkasi; 1441, Kin Sayok (120 km. n.w. Kwanburi).

var. **eubracteata** Corner v. nov.—Bracteae basales majores 4–5 mm. longae et latae, ovato-acutae. Lamina –11 × 5.5 cm., late elliptica v. ovato-elliptica. Thailand.

RFD 16711, Chiengmai, Chiengdao (typus, herb, Bangkok); 11990, Lampang, Ngao. Mae Huat.

Ut. var. *latifolia* sed bracteis basalibus quasi duplice majoribus.

var. **hillii** (Bailey) Corner comb, nov.—*F. hillii* F.M. Bailey. Contr. Queensl. Fl. 3 (1891) 16.—*F. schlechteri* Warb. Tropenfl. 7 (1903) 582.—Ut v. *mocrocarpa* sed costis basalibus vix elongatis, setis internis quasi nullis. Sunda Isl. (Alor Kechil), New Guinea, Queensland, New Caledonia, Loyalty Islands.

Forsan a v. *microcarpa* vix distincta.

var. **latifolia** (Miq.) Corner comb. nov.—*Urostigma accedens* Miq. v. *latifolia* Miq. Fl. Ind. Bat. 1, 2 (1859) 347.—*F. rigo* F.M. Bailey, *F. thynneana* F.M. Bailey, Queensl. Agr. J. 1 (1897) 231, 235.—*F. retusa* Linn. v. *rigo* (Bailey) Diels, Engl. Bot. Jahrb. 67 (1935) 183.—Ut v. *microcarpa* sed lamina –12 × 9 cm., late elliptica, apici obtuso v. subacuminato, basi rotundato v. late cuneato, venis subtus conspicuis, costis secundariis ut primariis quasi bene evolutis. Celebes, Moluccas, New Guinea, Queensland, Caroline Islands.

Celebes:—Nielsen 804. Moluccas:—Reinwardt s.n., Halawahoea (typus, herb. Leiden); de Vriese, Ternate; Alston 16649, Ternate. New Guinea:—Brass 3592, Rona, Laloki River; Carr 11441, Hisiu; Carr 11588, Veiya; NGF 8087, Port Moresby; Hellwig 187; Labillardiere, Waigeo Isl. Caroline Isl.:—Fosberg 25815, 25821, 25895, 31999, 32023; E.Y. Hosaka 3351.

var. **naumanni** (Engl.) Corner comb. nov.—*F. naumanni* Engl. Bot. Jahrb. 7 (1886) 451.—*F. dahlii* K. Schum. Notizbl. Bot. Gart. Mus. Berlin 2 (1898) 111.—*F. regnans* Diels, Engl. Bot. Jahr. 67 (1935) 182.—Receptacula pedunculo 1–5 mm. longo praedita, bracteis basalibus caducis. New Guinea, New Britain, New Ireland.

New Guinea:—Brass 21926, Cape Vogel Pen., Menapi; 27781, Sudest Isl., Joe Landing; Carr 12342, 12484, Rouna; Ledermann 7476, 9491, 10844, Sepik; Nyman 233, Stephansort; coll. cet. cit. Engler, Segaar et MacCluer Bay. New Britain:—Dahl s.n., Ralum; v. Hugel 572, Blanche Bay; Lauterbach 215, Ralum. New Ireland: —Naumann s.n., Cartaret Bay (typus, herb. Berlin).

var. **saffordii** (Merr.) Corner comb. nov.—*F. saffordii* Merr. Philip. J. Sci. Bot. 9 (1914) 73.—*F. prolixa* Forst. f. v. *saffordii* (Merr.) Fosberg, Phytologia 5 (1955) 289.—Lamina –8.5 × 4.5 cm., ovato-cordata v. subcordata, apice acuminato, costis basalibus ¼–1/3 laminae elongatis. Ins. Caroline, Marianas.

Marianas:—Anderson 235; Fosberg 25159, 31873, 35359; McGregor 414 (typus); Nelson 150, det. *F. tenuistipula* Caroline Isl.:—Fosberg 32166; Kanehira 1907.

F. prolixa facile confusa sed cystolithis amphigenis, superne ut verrucellis in lamina sicca, in *F. prolixa* modo in pagina inferiori.

F. palaquiifolia Corner sp. nov.—Arbor magna, epiphytica, suffocans, foliis spiraliter dispositis, glabra. Ramuli 4–5 mm. crassi. Stipulae –24 mm. longae. Lamina 7–12 × 3–6.5 cm., elliptica v. subobovata, breviter et acute acuminata, basi cuneato, coriacea, sicco brunnea: costis lateralibus primariis utrinsecus 7–13, vix elevatis, subcrenulatis, secundariis vix minus evolutis, intercostis nullis: costis basalibus utrinsecus 1, vix elongatis: petiolo 18–38 × 2–3 mm., sicco brunneo. Receptacula axillaria, binata, sessilia, 9–10 mm. lata (vivo, 12–15 × 10–13 mm.), subpyriformia v. subglobosa, sicco subverrucosa (pariete pertenui ad semina contracto), bracteis apicalibus 2–3 in discum convexum v. subconicum 2–3 mm. latum instructis: bracteis basalibus 7–10 mm. longis, ovatis, obtusis, quasi ½ receptaculi obscurantibus: setis internis nullis. Tepala 3—4, lineari-lanceolata, libera. Flores masculi pedicellati, feminei et cecidiophori sessiles. Semina crasse tunicata. Borneo.

Sing. F. n. 26703, 27413 (typus, herb. Singapore), Kinabalu, c. 1200 m. alt.; Hallier 3065, Liang Gagang.

F. polygramma, F. archboldiana, et *F. benjaminoides* affinis.

F. polygramma Corner sp. nov.—Arbor epiphytica, suffocans, foliis spiraliter dispositis, glabra v. ramuli, stipulae, petioli, et receptacula puberuli. Ramuli 3 mm. crassi. Stipulae 15–25 mm. longae. Lamina 6–9 × 3–5.5 cm., elliptica, breviter acuminata, basi late cuneato, coriacea, sicco brunnea: costis lateralibus

primariis utrinsecus 9–13, ad paginas ambas leviter elevatis, secundariis vix minus evolutis, intercostis nullis: costis basalibus utrinsecus 1, haud elongatis: petiolo –25 × 2.5 mm., nigro. Receptacula axillaria, binata, sessilia, 15 × 10–13 mm., pyriformia v. ellipsoidea, apice subtruncato v. obtuso, bracteis apicalibus 3 in cono brevi 1.5 mm. lato instructis: bracteis basalibus 3–4.5 mm. longis, ovatis, obtusis v. subacutis, crassiusculis, ad basim usque 1–2 mm. breviter et infundibuliforme connatis: setis internis nullis. Tepala 3, spathulata, libera. Flores masculi pedicellis subinduratis praediti, feminei et cecidiophori plus minus sessiles. Celebes.

Kjellberg 2702, Porema, c. 1200 m. alt. (typus, herb. Stockholm); Koorders 19429, 19275, Minahassa.

F. archboldianae Summerh. affinis sed bracteis basalibus connatis differt.

F. benjaminoides Corner sp. nov.—Arbor magna, epiphytica, suffocans, foliis spiraliter dispositis, glabra sed bracteis basalibus puberulis. Ramuli 3–4.5 mm. crassi, suberecti. Stipulae –20 mm. longae. Lamina 5–13 × 2.3–5.7 cm., anguste elliptica v. ovato-elliptica, acuta v. subacuminata, basi cuneato, tenue coriacea, sicco fusco-brunnea: costis lateralibus primariis utrinsecus 7–13, leviter elevatis, secundariis vix minus evolutis, intercostis nullis: costis basalibus utrinsecus 1–2, haud elongatis: petiolo 7–24 mm. longo, nigro. Receptacula axillaria, binata, sessilia, 5–6 mm. lata (6–7 × 7–8 mm., vivo), subglobosa, plus minus depressa, subumbonata, bracteis apicalibus 2 in discum planum v. subconvexum 2–2.5 mm. latum instructis: bracteis basalibus 2.5–4 × 3–6 mm., ovatis, obtusis, puberulis: setis internis nullis. Flores masculi pedicellati, sparsi v. aggregati, tepalis 2–3 spathulatis. Flores cecidiophori breviter pedicellati v. sessiles, tepalis 2–3; feminei sessiles, tepalis 3–4. Nova Guinea.

Brass 5433, Terr. N. Guinea, Central div., Mafulu, c. 1250 m. alt.; BW 6592, Neth. N. Guinea, Asmat region; Carr 12093, Papua, Koitaki, c. 400 m. alt. (typus, herb. Br. Mus.).

F. benjaminae similis sed foliis spiraliter dispositis sicco fusco-brunneis, ramulis suberectis, receptaculis minoribus, disco apicali latiori.

F. patellata Corner sp. nov.—Arbor magna, epiphytica, suffocans, foliis spiraliter dispositis, glabra. Ramuli 2.5–3 mm. crassi. Stipulae –11 mm. longae. Lamina 5–9 × 2.5–5 cm., elliptica,

breviter acuminata, basi late cuneato, coriacea, sicco brunnea: costis lateralibus primariis utrinsecus 13–16, gracilibus, vix elevatis, secundariis vix minus evolutis, intercostis nullis: costis basalibus utrinsecus 1, haud elongatis: petiolo 9–18 × 1.5–2 mm., nigro. Receptacula axillaria, binata, sessilia, 6–7 mm. lata, subglobosa, bracteis apicalibus 3 in discum planum 2 mm. latum instructis: bracteis basalibus in disco integro tumido patelliformi 6–7 mm. lato conjunctis: setis internis nullis. Flores masculi breviter pedicellati, tepalis 2. Flores cecidiophori sessiles v. subpedicellati, feminei sessiles, tepalis 3. Nova Guinea. (Exp. Lundquist, Aet 141, McCluer Bay, Jakati, pr. Bobo, typus herb. Leiden).

F. benjaminoides affinis sed receptaculo ad discum patelliformem instructo facile distinguitur.

sect. Malvanthera Corner ser. Malvanthereae Corner subser. Eubracteatae Corner

F. triradiata Corner sp. nov.—Arbor magna, epiphytica, suffocans, glabra. Ramuli 3–6 mm. crassi. Stipulae –6 cm. longae, caducae. Lamina 7–14 × 3.5–5.8 cm., elliptica v. obovato-elliptica, subacuta, basi cuneato, rigide coriacea, margine plus minus recurvo: costis lateralibus primariis utrinsecus 6–10, haud elevatis, secundariis minus conspicuis: costis basalibus utrinsecus 1, haud v. vix elongatis: petiolo 15–30 mm. longo, subapplanato. Receptacula axillaria, binata: pedunculo 4–6 × 5–6 mm., apice –10 mm. lato incrassato: bracteis basalibus 3, 5–7 × 7–10 mm., ovatis, obtusis, persistentibus: receptaculi corpore 18–22 × 14–17 mm., truncato-subconico, ostiolo profunde triradiato breviter mammillato, pariete 2–3.5 mm. crasso subligneo: setis internis nullis. Flores masculi pedicellati, tepalis 4 spathulatis liberis, anthero reniformi crescentiforme dehiscenti. Flores feminei et cecidiophori sessiles v. breviter pedicellati, tepalis 4–5 lanceolatis: ovario libero rubro, stigmate simplici. Queensland.

C. T. White 10536, Mt. Spurgeon (typus, herb. Brisbane); H. Flecher (N.Q. Naturalists Club n. 7260) Brooklyn-Mt. Lewis track.

var. **sessilicarpa** Corner v. nov.—Gracilis, laminis receptaculisque minoribus. Ramuli 3–4 mm. crassi. Lamina 6–12 × 2–4 cm., anguste elliptica v. lanceolata, costis primariis lateralibus utrinsecus 5–9. Receptacula 12–15 mm. (18–20 mm., vivo), subglobosa, plus minus sessilia: bracteis basalibus 5–7 × 8–10 mm. Queensland.

Brass 20052, Mt. Finnegan, 850 m. alt. (typus, herb. Brisbane).

sect. Malvanthera Corner ser. Malvanthereae Corner subser. Malvanthereae

F. glandifera Summerh. var. **brachysyce** Corner v. nov.—Receptacula 10–13 mm. longa, subglobosa v. obovoidea, ad basim cupula adnata 2.5–5 mm. alta et 10–13 mm. lata inserta. Lamina 4–14 × 2–6 cm., elliptica, costis lateralibus primariis utrinsecus 11–15. Tepala feminea et cecidiophora 1–3. Celebes, Nova Guinea.

Celebes:—Elbert 2945, Muna Isl., Lombai, S.E. Celebes. New Guinea:—NGF 5218, (typus, herb. Lae), 5232, 7422, Bulolo, Morobe distr., 3500 ped. alt.

sect. Malvanthera Corner ser. Malvanthereae Corner subser. Platypodeae Corner

F. leucotricha Miq. var. **megacarpa** F.v.M. ex Corner v. nov.—Ramuli crassior, 5–7 mm. Receptacula majora, 14 mm. lata, pedunculo 8–14 mm. longo: bracteis basalibus multo majoribus, –10 × 12 mm., apiculatis. Queensland (F. v. Mueller, Sea Range, typus herb. Kew).

Specimina in herb. Kew et Utrecht det. "F. lanata sp. nov. ∝ megacarpa" a F. v. Mueller, sed inedita. In v. *leucotricha* bracteae basales 4–5 mm. longae.

var. **sessilis** Corner v. nov.—Receptacula sessilia: bracteis basalibus –10 × 7 mm., ovato-caudiculatis. New South Wales (specimen typicum in herb. Manchester "J. E. Smith N.S.W." notatum).

F. obliqua Forst. f. var. **petiolaris** (Benth.) Corner comb. nov.—*F. platypoda* A. Cunn. ex Miq. var. *petiolaris* Benth. Fl. Austral. 6 (1873) 169.—This has the larger figs of *F. platypoda*, but the two basal bracts which distinguish *F. obliqua*. Some collections of *F. obliqua* have figs of intermediate size. As a detail, the leaves of var. *petiolaris* have the smooth lower epidermis of *F. obliqua*, not the finely striate epidermis round the stomata as in *F. platypoda*. The collection "Fraser, Brisbane and Hastings River", cited by Bentham is to be excluded because it is *F. macrophylla* Desf.

F. obliqua Forst. f. var. **puberula** (Benth.) Corner comb. nov.—*F. eugenioides* F.v.M. var. *puberula* Benth. Fl. Austral. 6 (1873) 167.—*Urostigma brachypodum* Miq. Hook. Lond. J. Bot. 6 (1847) 562.—*F. brachypoda* Miq. Ann. Mus. Bot. Lugd. Bat 3 (1867) 287.—Ramuli et petioli puberuli. Lamina 2.5–6 × 1.1–2.3 cm., lanceolato-elliptica, subacuta, basi anguste et abrupte rotundato, costis lateralibus primariis utrinsecus

8–9: petiolo 3–5 mm. longo. Receptacula 5–6 mm. lata, breviter pedunculata. Queensland (A. Cunningham 304, York Sound, typus herb. Kew).

F. platypodae v. *minoris* similis sed puberula et receptaculum minus.

F. subpuberula Corner nom. nov.—*F. puberula* A. Cunn. ex Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 237, (non Kunth et Bouch., 1847).—This little known species may be a variety of *F. platypoda.*

F. platypoda A. Cunn. ex Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 287; Benth. Fl. Austral. 6 (1873) 169.—*Urostigma platypodum* Miq. Hook. Lond. J. Bot. 6 (1847) 561.—Miquel cited originally three collections:—

1. Cunningham, York Sound, (Herb. Hook), which is the type;
2. Fraser, Brisbane and Hastings River, called "forma major", which Bentham transferred to *F. platypoda* var. *petiolaris* Benth., but which is *F. macrophylla* Desf., and must be excluded;
3. Bynoe (Herb. Hook), called "forma minor" which is *F. platypoda* var. *minor* Benth.

sect. Malvanthera Corner ser. Malvanthereae Corner subser. Hesperidiiformes Corner

F. augusta Corner sp. nov.—Arbor magna, epiphytica, suffocans. Ramuli, stipulae, et saepe receptacula albido-puberuli, glabrescentes. Ramuli 7–10 mm. crassi. Stipulae –22 cm. longae, vivo rubrae. Lamina –26 × 17 cm., ovato-subcordata v. late elliptica, subacuta v. breviter acuminata, basi rotundato-cordato v. late cuneato, coriacea: costis lateralibus primariis utrinsecus 12–17, vix elevatis, secundariis minus conspicuis: costis basalibus utrinsecus 1 (–2), ¼–1/3 laminae elongatis: petiolo 30–100 × 3–5 mm. Receptacula axillaria, binata, maturitate rubescentia; pedunculo 4–6 × 5–7 mm. v. 20–25 × 8–10 mm., apice haud v. vix dilatato: bracteis basalibus 3, 1–2.5 × 2–3.5 mm., crescentiformibus, denique caducis: receptaculi corpore 50–80 × 27–50 mm., oblongo-ellipsoideo, apice umbonato (5–7 × 10–17 mm.), bracteis apicalibus inflexis 2–3 gibbosis: setis internis nullis: pariete crasso, lignoso, processibus floriferis praedito. Flores ut in *F. xylosycia* Diels, tepalis 3–4. Flores

masculi pedicellati, anthero reniformi crescentiforme dehiscenti sessili. Flores feminei sessiles, ovario in receptaculi pariete semi-immerso, stigmate longe bifido. Nova Guinea.

Hoogland 5454, Terr. N. Guinea, Eastern Highlands, Goroka subdistr., Asaro Mairi divide, 2400 m. alt. (typus, herb. Lae); NGF 1020, Aiyura area.

F. hesperidiiformis King var. **myrmekiocarpa** (Summerh.) Corner comb. nov.—*F. myrmekiocarpa* Summerh. J. Arn. Arb. 22 (1941) 82.—This has somewhat smaller figs with more expanded apex to the peduncle than typical *F. hesperidiiformis,* but I can find no essential difference.

F. xylosycia Diels var. **cylindrocarpa** (Diels) Corner comb. nov.—*F. cylindrocarpa* Diels, Engl. Bot. Jahrb. 67 (1935) 181.—This has a smaller, narrowly cylindric fig with slender peduncle, but it grades into typical *F. xylosycia,* as in Carr 14050 (Papua).

Taxonomic Notes on Ficus Linn., Asia and Australasia

II. SUBGEN. PHARMACOSYCEA MIQ.

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Summary

New sections, series, and subseries:—sect. *Oreosycea* (Miq.) Corner comb. nov., ser. *Vasculosae* Corner, subser. *Vasculosae*, subser. *Albipilae* Corner, ser. *Nervosae* Corner, ser. *Austrocaledonicae* Corner.

Earlier specific epithets:—*F. albipila* (Miq.) King (*F. colossea* F. v. Muell. ex Benth, *F. microtricherinos* Backer); *F. habrophylla* G. Bennett (*F. edulis* Bur.).

New name for later homonym:—*F. pachystemon* Warb. (*F. mangiferifolia* K. Schum. et Laut., haud Griffith).

New species:—*F. gratiosa* Corner, *F. pachysycia* Diels ex Corner, *F. hombroniana* Corner, *F. subnervosa* Corner, *F. kjellbergii* Corner, *F. madhucifolia* Corner, *F. pseudojaca* Corner.

New varieties:—*F. albipila* (Miq.) King v. *glabra* Corner, *F. gratiosa* Corner v. *caudata* Corner, *F. pubinervis* Bl. v. *diandra* Corner et v. *sibulanensis* (Elm.) Corner, *F. subtrinervia* K. Schum. et Laut. v. *doormaniana* (Diels) Corner, *F. granatum* Forst. f. v. *minor* Corner, *F. smithii* v. *robusta* Corner, *F. austrocaledonica* Bur. v. *balansaeana* Corner.

Notes on *F. hadroneura* Diels.

subgen. Pharmacosycea Miq.

Ann. Mus. Bot. Lugd. Bat. 3 (1867) 299.—*Pharmacosycea* Miq. Hook. Lond. J. Bot. 6 (1847) 525; id. 7 (1848) 64.—Monoecious, all three kinds of flower in the same receptacle. Receptacles without lateral bracts on the body: interfloral bracts often present. Male flowers ostiolar or disperse: stamens 1–3, occasionally with pistillode. Gall- and female flowers similar, but the female generally sessile with longer style: ovary white or with a red spot at the base, sessile: style glabrous, stigma bifid.

Seed smooth, often keeled over the apex. Trees, rarely shrubs (not epiphytic, creeping, or climbing). Leaves generally entire and with a gland in the axil of each main basal nerve. Lectotype:—*F. maxima* P. Mill. (= *F. radula* Willd.).

sect. **Pharmacosycea.**—*Ficus* sect. *Pharmacosycea* (Miq.) Benth. et Hook. Gen. Pl. 3 (1880) 369.—Fig solitary, orifice in some species crateriform: interfloral bracts present: internal bristles absent. Male flowers disperse: stamens 2–3, the filaments sometimes shortly joined. Ovary often with a red mark at the base on the stylar side. Cystoliths amphigenous. Stomata superficial or sunken. Microscopic gland-hairs with 4–6–12-celled head. Tropical America, c. 12 species: lectotype *F. maxima* P. Mill.

sect. **Oreosycea** (Miq.) Corner comb. nov.—*Urostigma* Gasp. sect. *Oreosycea* Miq. Hook. Lond. J. Bot. 6 (1847) 525, 585: Fl. Ind. Bat. I, 2 (1859) 353.—*Ficus* Linn. subgen. *Urostigma* (Gasp.) Miq. sect. *Oreosycea* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 286.—*Ficus* Linn. sect. *Leiosycea* Miq. Hook. Lond. J. Bot. 7 (1848) 454.—*Ficus* Linn. subgen. *Urostigma* (Gasp.) Miq. sect. *Stilpnophyllum* Endl. subsect. *Pedunculatae* Sata, Monogr. (1944) 179.—Figs typically paired, orifice not crateriform: interfloral bracts and internal bristles present or not. Male flowers disperse or ostiolar: stamens 1 or 2, rarely 3. Ovary without a red spot. Cystoliths mostly hypogenous, in a few species amphigenous. Stomata not sunken. Microscopic gland-hairs with 2–4-celled head. Madagascar, Asia, Australasia, 45 species: lectotype—*F. nervosa* Heyne ex Roth.

ser. **Vasculosae** Corner ser. nov.—Folia exsiccata griseo-viridia v. pallide brunnea, nervis reticulatis saepe ad paginam unam vel ambas elevatis, glandulis basalibus saepe nullis v. indistinctis. Receptaculum pedunculo distincto praeditum, cellulis scleroticis in pariete copiosis. Stamina plerumque 2 in floribus ostiolaribus (1 in *F. gratiosa*). Madagascar, Asia, New Guinea, Queensland, 7 species. Typus—*F. vasculosa* Wall ex Miq.

subser. **Vasculosae.**—sect. *Leiocarpa* Miq. l.c. (typus—*F. vasculosa* Wall.)—subsect. *Pedunculatae* Sata l.c. (lectotypus *F. callosa* Willd., = *F. malunuensis* Warb.).—Folia nitida coriacea, nervis intercostalibus numerosis (*F. callosa*) v. 0–1. Setae internae nullae (numerosae in *F. gratiosa*). Cystolitha hypogena. Sempervirens. Asia, 4 species. Typus—*F. vasculosa* Wall.

subser. **Albipilae** Corner subser. nov.—Folia haud nitida, membranacea v. chartaceo-coriacea, nervis intercostalibus 3-numerosis.

Setae internae copiosae v. nullae. Arbores deciduae, saepe albipilosae. Madagascar, Andaman Isl., Indochina, Thailand, Malaysia, Queensland, 3 species. Typus—*F. albipila* (Miq.) King.

ser. **Nervosae** Corner ser. nov.—Folia exsiccata saepissime fusco-brunnea, leniter v. rigide coriacea, glandulis basalibus 2 conspicuis, stipulis saepe elongatis. Receptaculum pedunculo saepe brevi praeditum. Stamen 1, vel 2 (–3). Arbores grandes, ? sempervirentes. Asia, New Guinea, Solomon Islands, 16 species. Typus.—*F. nervosa* Heyne ex Roth.

ser. **Austrocaledonicae** Corner ser. nov.—Folia exsiccata plerumque fusco-brunnea, membranacea v. coriacea, glandulis basalibus 2 plerumque conspicuis, stipulis haud elongatis. Stamina 1–2–3. Arbores mediocres v. suffrutices. raro grandes (*F. smithii*), ? sempervirentes. New Caledonia, Loyalty Isl., New Hebrides, Fiji, Solomon Isl., 23 species. Typus—*F. austrocaledonica* Bur.

It has been assumed on geographical grounds that this subgenus was confined to the American tropics but, as I have shown (Reinwardtia 4, 1958, 26), a block of Old World species, grouped about *F. vasculosa, F. nervosa,* and *F. austrocaledonica,* has the same essential characters and, indeed, is with difficulty distinguished. These Old World species have been referred to subgen. *Urostigma* where they are out of place, particularly in being independant trees and not banyans or stranglers. The species of New Caledonia have never been properly classified, and they are the closest in several respects to the American. The subgenus is absent from Africa, excepting Madagascar, where *F. assimilis* J. Baker occurs: it is almost the same as the wide-spread *F. albipila* (Thailand to Queensland).

I divide the subgenus into two sections, maintaining the geographical distinction for convenience, but redefinition will be necessary when the American species are better known. Indeed, nearly all distinctions, from varietal upwards, are unsatisfactory, and the whole group gives the impression of one played out into minor variation.

Typification. For the subgenus I take, on the concurrence of G. DeWolf, who has been studying the American species, *F. maxima* P. Mill.: he writes "It is the oldest species in point of description and probably the commonest in point of occurrence, also the most wide-spread". For sect. *Oreosycea,* Miquel gave originally the two

species *Urostigma nervosum* (Heyne) Miq. and *U. modestum*, which is a synonym of the first. Sect. *Leiosycea* had only *F. vasculosa* Wall.

ser. Vasculosae Corner subser. Albipilae Corner

F. albipila (Miq.) King, Ann. R. Bot. Gard. Calc. 1 (1888) 179.—*Covellia* ? *albipila* Miq. Fl. Ind. Bat. Suppl. (1860) 175, 434. *Morus leucophylla* Miq. id. 415.—*F. mollis* Miq. var. *albipila* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 283, 296. *F. colossea* F. Muell. ex Benth. Fl. Austral. 6 (1873) 163.—*F. mallotoides* Val. ex Backer, Blumea 6 (1948) 304 (non Mildbr. et Hutch., 1915).—*F. microtricherinos* Backer, Bekn. Fl. Java 6 (1948) 40.—*F. cordifolia* Bl. sensu Koord. et Val. Bijdr. Booms. Java 11 (1906) 57, 60; Ic. Bog. XI, t.16: Atlas 4 (1916) f. 701.—This is the most widely distributed species of the subgenus. Collections are few, possibly because it is a large tree, but they indicate a range from North Thailand through Malaya, Sumatra, Java, Timor, and New Guinea to Queensland, where the species was common. *F. assimilis* Baker is a very close ally in Madagascar. I have examined all types; sterile specimens can easily be recognised from the amphigenous cystoliths.

var. **glabra** Corner v. nov.—Praeter setas internas glabra. Borneo (J. Motley 613, Banjermasin, typus herb. Cambridge).

This is the only collection of the species from Borneo.

ser. Vasculosae Corner subser. Vasculosae

F. gratiosa Corner sp. nov.—Arbor –10 m. alta, foliis spiraliter dispositis. Ramuli, petioli, et costa (subtus) pilis cinnamomeis v. fusco-brunneis 0.5–1 mm. longis villoso-tomentosis, etiam saepe pilis minutis undulatis: nervi subtus villosi v. sparsim puberuli. Ramuli 2–4 mm. crassi. Stipulae 10–25 mm. longae, brunneo-sericeae. Lamina 12–20 × 3.5–5.7 cm., lanceolato-elliptica v. lanceolato-obovata, subacuta v. obtuse subacuminata, basi cuneata, subcoriacea, rigida, supra nitida, sicco griseo-viridis v. subfusca: costis lateralibus utrinsecus 10–13, obliquis, subtus valde elevatis, intercostis 0–1, nervis reticulatis supra leviter elevatis; nervis basalibus utrinsecus 1, brevibus, glandulis basalibus 2: petiolo 12–25 mm. longo. Receptacula axillaria, binata v. solitaria, brunneo-villosa glabrescentia: pedunculo 2–8 mm. longo: bracteis basalibus 1.5–3 mm. longis, sericeis: pedicello 0–2 mm. longo: corpore receptaculi 13–20 mm. lato, subgloboso, ostiolo 3–4 mm. lato bracteis parvis numerosis occluso:

setis internis nullis: cellulis scleroticis in pariete copiosis, tenuitunicatis. Tepala (3–) 4, lanceolata, longa glabra, in floribus masculis cecidiophorisque plus minus gamophylla. Flores masculi ostiolares, raro dispersi, sessiles: stamen 1 (–2). Semina 1.2–1.5 mm. longa, anguste carinata. Cystolitha hypogena. Celebes.

NIFS bb. 19584, Malili, 1,300 m. alt. (*typus*, herb. Leiden). Koorders 19349, Minahassa (Ficus sp. "R"). Sarasin 438, Minahassa, Tomaton (F. mollicosta Warb. ined.). Kjellberg 2688, Porema, 1,200 m. alt.

var. **caudata** Corner v. nov.—Lamina –27 × 9 cm., elliptica, apice caudato –30 mm. longo: intercostis 3–7: petiolo –40 mm. Receptacula pedunculo 2–3 mm., pedicello –10 mm. praedita: setis internis sparsis: pariete 2–3 mm. crasso. Celebes (Kjellberg 2886, Todjamboe, 800 m. alt., *typus*—herb. Stockholm).

Species distinctissima, *F. pubinervem* Bl. revocans sed lamina nitida, stipulis brevibus, *F. vasculosae* Wall. affinior.

ser. Nervosae Corner

F. pachysycia Diels ex Corner sp. nov.—Arbor, foliis laxe spiraliter dispositis. Ramuli, stipulae, petioli, et costa subtus breviter appresse brunneolo-pilosi, glabrescentes. Ramuli 4–5 mm. crassi. Stipulae –20 mm. longae. Lamina 10–19 × 6.5–12 cm., elliptica, obtusa, basi cuneata, crasse coriacea, rigida, sicco brunnea: costis lateralibus utrinsecus 7–10, intercostis 3–5 ad ambas paginas leviter elevatis: nervis basalibus utrinsecus 1 (–2), brevibus: petiolo 12–25 × 4–5 mm., crasso. Receptacula (? axillaria, solitaria), 40–50 × 30–35 mm., oblongo-pyriformia, attenuata in pedicellum brevem 2–4 mm. latum bracteis lateralibus 1–2, c. 2 mm. longis, praeditum, bracteis haud in collare ternatis, ostiolo plano 4–5 mm. lato bracteis apicalibus 4–5 vix projicientibus occluso: setis internis nullis: pariete crassissimo, sicco 5–10 mm. crasso, valde sclerotico, lumine multo compresso et in sectione elliptico. Tepala 4, libera, rubra. Flores masculi dispersi copiosi: pedicellis 1.5–2.5 mm. longis: tepalis spathulatis: staminibus 2 (–3), haud mucronatis, pistillodio nullo. Flores cecidiophori pedicellis 0.5–2 mm. longis: tepalis ovato-lanceolatis: stigmate breviter bifido. Flores feminei similes, sessiles. Semina ? Cystolitha hypogena. New Guinea (Clemens 3676, Morobe District; typus-herb. Berlin, det Diels ms.).

Lamina ut in *F. subnervosa* Corner, receptaculum *F. habrophyllam* Benn. (ser. *Austrocaledonicae*) revocans.

F. hombroniana Corner sp. nov.—Arbor –27 m. alta, latice serifluo albido, foliis spiraliter dispositis. Ramuli, stipulae petioli, et nervi subtus dense v. sparsim pilis subfulvis 0.5–1 mm. longis appresse vestiti, v. puberuli glabrescentes. Ramuli 2–4 mm. crassi. Stipulae 20–75 mm. longae, subulatae, curvatae, sericeae v. glabrae. Lamina 7–19 × 3.5–8.5 cm, elliptica, plerumque obovata, obtusa v. subacuta (? in juventute subacuminata), basi cuneata, subnitida, coriacea, sicco brunnea: costis lateralibus utrinsecus 9–13, confertis, inferioribus ad costam quasi rectangulatis, subparallelis, intercostis 0–4 indistinctis, vix elevatis: costis basalibus utrinsecus 1 (–2), glandulis basalibus 2: petiolo 5–22 × 2–3 mm. Receptacula axillaria, binata, glabra, maturitate rufa: pedunculo 0–2 mm. longo: bracteis basalibus 2–3, 1–1.5 × 1.5–2 mm., ovato-acutis, appresse puberulis: pedicello 2–12 × 1 mm.: corpore receptaculi 10–12 mm. lato, subgloboso v. ovoideo, ostiolo 1–1.5 mm. lato bracteis apicalibus 2–3 occluso: setis internis nullis: cellulis scleroticis copiosis per parietem 1.2–2 mm. crassum. Perianthium gamophyllum, breviter 2–3-lobatum, rubrum, glabrum. Flores masculi ostiolares sessiles, et dispersi pedicellati: stamine 1. Flores feminei et cecidiophori sessiles v. pedicellati: stigmate bifido. Semina in loculis in pariete ligneo receptaculi plus minus inserta. Cystolitha hypogena. Moluccas, New Guinea, Solomon Isl.

Amboina:—de Fretes 5762; Hombron s.n. (herb. Paris); H.B. 1885 (herb. Utrecht 47537); de Vriese s.n. (herb. Leiden). Batjan:—n. 5610 (Herb. Utrecht 47536). Boeroe:—Stresemann 367. Saparoea:—Reinwardt s.n., 1821 (herb. Leiden). Netherlands New Guinea:—BW 6506, Asmat region, Erma, 'terkeen' (Asmat). Papua:—Brass 28598 (typus, Grey herb., Harvard), 28653, Woodlark Isl, Kalumadau. Solomon Isl.:—J.H.L. Waterhouse B286a, Bougainville, Siwai, 'tuparemu', 'tarimu'. Java:—cult. Hort. Bog. VIII C 9.

A Hombron (Voyage de l'Astrolabe et de la Zélée, 1838–1840) primo collecta sed in statu sterili. Hic *F. pubinervem* Bl. pilis appressis stipulis elongatis similis, illic receptaculis floribusque *F. smithii* Horne revocans; lamina etiam ut in *F. pachystemon*.

F. pubinervis Bl. var. **diandra** Corner v. nov.—Flores masculi ostiolares sessiles, et dispersi pedicellati: staminibus 2, raro 1. Receptacula 6–8 mm. lata, sessilia. Stipulae 10–28 mm. longae. Celebes.

Kjellberg 2060, Waroe-waroe; Kjellberg 2100, Malili; NIFS Cel/II–366, Malili, Oesoe; NIFS bb. 1831, Malili, La Roua; Teysmann 12423, Pangkadjena (*typus*, herb. Bogor); Teysmann 12773 (Maros), 13964 (Bonthain, Lokka).

Receptaculis parvis diandris distinguenda; ad *F. subtrinerviam* v. *doormanianam* approximans.

F. pubinervis Bl. v. **sibulanensis** (Elm.) Corner comb. nov.—*F. sibulanensis* Elm. Leafl. Philip. Bot. 4 (1911) 1266.—*F. pubinervis* Bl. f. *sibulanensis* (Elm.) Sata, Monogr. (1944) 187. —Lamina subtus pilis erectis molliter villosa. Philippines (Elmer 11154, Mindanao, Mt. Apo, *typus;* Bur Sci. 17530, Samar, det. F. samarensis Merr. ined.).

F. subnervosa Corner sp. nov.—Arbor –25 m. alta, cortice griseo, latice copioso, foliis laxe spiraliter dispositis, glabra. Ramuli 1–2.5 mm. crassi. Stipulae 7–26 mm. longae, in novellis prominentes. Lamina 9–22 × 3.6–10 cm., elliptica v. obovata, obtusa, subacuta v. obtuse subacuminata, basi cuneata, tenue coriacea, sicco brunnea: costis lateralibus utrinsecus 5–9 (–10), subtus vix elevatis, intercostis 1–3 indistinctis: costis basalibus utrinsecus 1 (–2), brevibus, glandulis basalibus 2: petiolo 7–22 mm. Receptacula axillaria, binata v. solitaria: pedunculo 0–6 mm. longo: bracteis basalibus 3, 1 mm. longo: pedicello 2–4 mm. longo: corpore receptaculi 10–18 mm. lato (17–30 mm., vivo), subgloboso, ostiolo parvo plano bracteis apicalibus paucis occluso: setis internis nullis: pariete 1–1.5 mm. crasso, carnoso, cellulis scleroticis nullis v. sparsis. Perianthium breviter 3–4-lobatum carnosum, rubrum. Flores masculi dispersi pauci pedicellati, ostiolares sessiles: stamine 1. Flores cecidiophori pedicellati, feminei sessiles: stigmate bifido. Semina 1 mm. longa, vix carinata. Cystolitha hypogena. New Guinea.

Netherlands New Guinea:—Aet 582, Tarera, pr. Oeta; Aet et Idjan 721, Jappen-Biak, pr. Seroei; Beccari s.n., Andai (R. Ist. Fir. 9244); BW 1828, Hollandia, Skyline; Kostermans 374, 450 (*typus,* herb. Leiden), 2940, 2961, Manokwari, Warnapi, Warsui, Momi; v. Royen 3060, Sorong.

Papua:—Brass 27288 (Fergusson Isl.), 28092 (Sudest Isl.), 28576 (Rossel Isl.). Terr. New Guinea:—Hoogland 4811, Northern district, Tufi subdistr., Korea village; Ledermann 6819, Sepik (det. *F. subulata* Bl.): J. C. Saunders 223, 449, Madang district, Bismark Range, Ramu valley.

Species glabra paucinervosa, receptaculi pariete carnoso, perianthio gamophyllo distincta. Cave *F. casearioidem* King et *F. pedunculosam* Miq., species dioicas.

F. kjellbergii Corner sp. nov.—Arbor mediocris, –5 m. alta, glabra, foliis dense spiraliter dispositis. Ramuli 1–2 mm. crassi. Stipulae 5–11 mm. longae. Lamina 4–7.5 × 2–3.8 cm., obovata, obtusa

v. subacuta, basi attenuato-cuneata, tenue coriacea, sicco fusco-brunnea: costis lateralibus utrinsecus 7–9, haud v. vix elevatis, intercostis nullis: costis basalibus utrinsecus 1, brevibus, glandulis basalibus 2 in axillis costarum lateralium primarum: petiolo 6–18 mm. longo. Receptacula axillaria, binata, maturitate e flavo rubescentia; pedunculo nullo: bracteis basalibus 2–3, 0.5 mm. longis, ad basim pedicelli 6–9 mm. longi: corpore receptaculi 6–8 mm. lato, subgloboso, ostiolo plano 1 mm. lato bracteis apicalibus parvis occluso: setis internis nullis: cellulis scleroticis in pariete copiosis. Perianthium breviter 3 (–4)-lobatum, rubrum. Flores masculi ostiolares sessiles (? paucissimi dispersi): stamine 1. Flores cecidiophori pedicellati, feminei sessiles: stigmate bifido. Cystolitha hypogena. Celebes (Kjellberg 2437, Tolala, *typus* herb. Stockholm).

Ut *F. hombroniana* Corner, sed in omnibus partibus minor et paucinervosa, stipula haud prominenti.

F. subtrinervia Laut. et K. Schum. var. **doormaniana** (Diels) Corner comb. nov.—*F. doormaniana* Diels, Engl. Bot. Jahrb. 67 (1935) 192.—*F. behrmanniana* Diels, id.—Lamina –24 × 8.5 cm., ovato-lanceolata v. elliptico-lanceolata, attenuata v. subacuminata: costis lateralibus utrinsecus 8–16. Bracteae basales acutae. Plus minus glabra. New Guinea.

H. J. Lam 1380, Mamberamo R., Doorman R. (*typus*); Docters v. Leeuwen 10259, Rouffaer R.; Kanehira et Hatusima 12813, pr. Nabire; NIFS bb. 30583, Jappen Isl., Seroei; Ledermann 8249, Sepik (*typus, F. behrmanniana* Diels); Brass 13222, 13433, 13679, Idenburg R.; Brass 28076, Papua, Sudest Isl.; Hinds s.n., (det *F. pubinervis*).

Ad *F. pubinervem* v. *diandram* Corner approximans, sed costis lateralibus pluribus.

F. pachystemon Warb. in Laut. et K. Schum. Nachtr. Fl. Schutzgeb. (1905) 242.—*F. mangiferifolia* Laut. et K. Schum. Fl. Schutzgeb. (1901) 275, haud Griffith 1854.—The type of *F. pachystemon* (Dahl s.n., Ralum, Gazelle Peninsula, Neu Pommern) at Berlin has shorter leaves and smaller figs (10–11 × 8–9 mm.) than in the later homonym *F. mangiferifolia* but I can see no other difference. The species seems not uncommon as a river-side shrub or tree in New Guinea and New Britain, and such variability is likely.

F. madhucifolia Corner sp. nov.—Arbor, foliis fasciculato-confertis, glabra. Ramuli 3 mm. crassi. Stipulae –30 mm. longae. Lamina 8–20 × 3–9 cm., anguste obovata, subacuta, basi

cuneata, tenue subcoriacea, sicco brunnea: costis lateralibus utrinsecus 7–9, subtus leviter elevatis, 0–2 (–3) intercostis: costis basalibus utrinsecus 1, brevibus, glandulis basalibus 2: petiolo 7–20 mm. longo. Receptacula axillaria, binata, sessilia, 10–11 mm. lata, subglobosa, ostiolo plano bracteis apicalibus applanatis 3 occluso: bracteis basalibus 3, 2–3.5 × 2–2.5 mm., ovatis, acutis: setis internis nullis: cellulis scleroticis in pariete copiosis. Tepala 3–4, libera, rubra, oblonga. Flores masculi dispersi, copiosi, plus minus sessiles: stamine 1. Flores cecidiophori sessiles v. breviter pedicellati, feminei sessiles: stigmate bifido. Cystolitha hypogena. Celebes (Buwalda 3719, Bantimoerong, *typus* herb. Leiden; Teysmann 12621, 12637, Tjambu).

F. gratiosam Corner lamina floribusque sessilibus revocans, sed glabra, receptacula sessilia, flores masculi dispersi copiosi.

F. hadroneura Diels, Engl. Bot. Jahrb. 67 (1935) 186.—This extremely interesting, large-leafed species, allied perhaps with *F. pseudojaca* Corner, is represented by three sterile collections and the type (Lane Poole and Brass 290), of which there is a leaf only in the Berlin-herbarium, but a leafy twig with figs in the Brisbane-herbarium. This Brisbane specimen is labelled by Diels and must be taken as the type. Identical with it are:—

BW 390, 365, Manokwari, Prafi, 'ateska'; J. C. Saunders 532, Terr. New Guinea, Madang subdistr., Ramu valley, 5 miles S.E. of the Faita airstrip, rainforest, c. 800 ft. alt., 'uli' (Bilia), 'bambam' (Amele), 'sungung' (Dumpu).

F. pseudojaca Corner sp. nov.—Arbor –35 m. alta, cortice brunneolo, latice cremeo, foliis distichis. Ramuli, petioli, et stipulae pilis flexuosis cervicoloribus 0.5–1 mm. longis villosi, costae et costulae subtus appresso-puberulae. Ramuli 2.5–4 mm. crassi. Stipulae 12–18 mm. longae. Lamina 10–21.5 × 4.5–14 cm., elliptica v. ovato-elliptica, subacuta v. breviter acuminata, basi rotundata v. late cuneata et minute auriculata, subasymmetrica, chartacea v. tenue coriacea, sicco fusco-brunnea v. griseoviridis: costis lateralibus utrinsecus 10–15, supra impressis, subtus prominentibus, intercostis 3–9, nervulis reticulatis supra tenue, subtus valdius, elevatis: costis basalibus utrinsecus 3, brevibus, glandulis basalibus 2: petiolo 6–20 × 2.5–3.5 mm. Receptacula ? Cystolitha hypogena. New Guinea.

Netherlands New Guinea:—BW 1399, Salawati Isl. Terr. New Guinea:—NGF 1944, Lae; J. C. Saunders 289, 294, 301, 430 (*typus*, herb. Lae), 595, Madang district, Ramu Valley. Papua:—L. E. Cheesman 40, Kokoda.

Specimina sterilia, nihilominus species facile distinguenda, Artocarpum simulans, forsan *F. hadroneurae* Diels affinis.

ser. Austrocaledonicae Corner

F. habrophylla G. Bennett ex Seem. Fl. Vit. (1868) 248.—*F. bennettii* Seem. id., 250.—*F. tanensis* G. Bennett ex Seem. id., 248.—*F. edulis* Bur. Ann. Sci. Nat. ser. 5, Bot. 14 (1872) 271.—The types of *F. habrophylla* and *F. tanensis* at Kew, both from Tanna, show that they are identical with *F. edulis*, as Bureau suspected. The type of *F. bennettii*, at the British Museum, is from a plant cultivated in the Sydney Botanic Garden. This is an extremely variable species requiring field-examination.

F. granatum Forst. f. var. **minor** Corner v. nov.—Arbor –25 m. alta. Stipulae, pedunculi, bracteaeque basales tenue appresse brunneo-puberuli. Ramuli 2–4 mm. crassi. Lamina 11–23 × 6–10 cm., elliptica v. elliptico-obovata, obtusa v. subacuta, basi cuneata: costis lateralibus utrinsecus 9–11, intercostis 1–3: petiolo 20–80 × 1.5–2.5 mm. Receptacula maturitate rubra: pedunculo 0–5 mm. longo: bracteis basalibus 3, 1–1.5 mm. longis, caducis: pedicello 2–6 mm. longo: corpore receptaculi 10–11 × 8 mm., ellipsoideo, ostiolo plano 1.5 mm. lato bracteis apicalibus disciformibus occluso: setis internis copiosis: cellulis scleroticis in pariete copiosis. New Hebrides (Aneityum, Eromango: Kajewski 324, 732-*typus* herb. Kew, 956).

Ut v. *granatum* sed gracilior et receptacula multo minora, v. *granatum* ipsa quamvis raro collecta nec satis cognita.

F. smithii Horne ex Baker var. **robusta** Corner v. nov.—Arbor –30 m. alta, stipulis ramulisque appresse brunneolo-pilosis glabrescentibus. Lamina 7–22 × 3.6–9.5 cm., elliptica v. elliptico-obovata, obtusa v. subacuta: costis lateralibus utrinsecus 8–13: petiolo 15–35 × 1.5–3 mm. Receptacula 10–13 mm. lata, pedunculo 7–15 × 1–1.5 mm, pedicello 0–5 mm.: cellulis scleroticis sparsis in strato parietis interno. Flores masculi et cecidiophori pedicellis induratis scleroticis. New Hebrides (Aneityum), Fiji (Viti Levu, Vanua Levu, Taveuni), in silvis ad 700 m. alt.

New Hebrides:—Kajewski 862, 955, Aneityum, Anelgauhat Bay. Vanua Levu:—A. C. Smith 605, 1728. Viti Levu:—A. C. Smith 5357, 5879, 5952, 5995, 8497, 8709, 9162, 9273. Taveuni:—J. W. Gillespie 4753, A. C. Smith 8339 (typus, herb. Cambridge).

Var. *smithii* gracilis, –15 m. alta: lamina –13 × 4.2 cm., anguste elliptica v. lanceolata, obtuse acuminata, costis lateralibus

utrinsecus 7–9, petiolo 4–14 mm.: receptacula 5–6 mm. lata, pedunculo 6–12 × 0.5 mm., gracillimi, cellulis scleroticis in pariete copiosis: Fiji, Solomon Isl. (Guadalcanal).

F. austrocaledonica Bur. var. **balansaeana** (Bur.) Corner comb. nov.—*F. balansaeana* Bur. Ann. Sci. Nat. ser. 5, Bot. 14 (1872) 262.—So far as I can see this differs from v. *austrocaledonica* merely in the closely and appressedly hairy twigs, petioles, pedicels, and fig-body. It is known only from the type, Balansa 138 (New Caledonia, Prony Bay).

Taxonomic Notes on Ficus Linn., Asia and Australasia

III. SUBGEN. FICUS AND SECT. FICUS

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Summary

New subsections, series and subseries of sect. *Ficus:*—subsect. *Ficus* ser. *Rivulares, Pseudopalmeae, Sinosyceae, Cariceae, Erythrogyneae, Podosyceae,* subser. *Basitepalae;* subsect. *Eriosyceae* (Miq.) Corner, ser. *Eriosyceae,* subser. *Eriosyceae, Trichosyceae, Dehiscentes, Cuneifoliae;* ser. *Auratae,* subser. *Auratae, Monandreae.*

Earlier specific epithets:—*F. subincisa* B. Ham. ex J.E. Sm. (*F. cunia* B. Ham. ex Roxb.), *F. neriifolia* J.E. Sm. (*F. nemoralis* Wall. ex Miq.), *F. gasparriniana* Miq. (*F. silhetensis* Miq.).

New species:—*F. trivia, F. halmaherae, F. subfulva* et var. *villosula, F. litseifolia, F. endospermifolia, F. bruneiensis, F. brunneoaurata, F. androchaete, F. eumorpha* et v. *subglabra, F. paramorpha.*

New varieties and forms:—*F. deltoidea* Jack v. *angustifolia* (Miq.) Corner et f. *angustissima,* v. *arenaria,* v. *bilobata,* v. *borneensis* et f. *subhirsuta,* v. *intermedia,* v. *kunstleri* (King) Corner, v. *lutescens* (Desf.) Corner et f. *longipedunculata* et f. *subsessilis* (Miq.) Corner, *v. motleyana* (Miq.) Corner, v. *oligoneura* (Miq.) Corner, v. *peltata,* v. *trengganuensis.*—*F. oleaefolia* King v. *dodonaeiformis* (Gagnep.) Corner, v. *memecylifolia,* v. *myrsinoides,* v. *riparia. F. neriifolia* J.E. Sm. v. *fieldingii* (Miq.) Corner, v. *nemoralis* (Wall. ex Miq.) Corner, v. *trilepis* (King) Corner. *F. pedunculosa* Miq. v. *confertifolia* (Merr.) Corner, v. *imberbis* (Elmer) Corner, v. *macropoda* (Miq.) Corner, v. *mearnsii* (Merr.) Corner, v. *segaarensis* (Engl.) Corner, v. *velutina*—*F. erecta* Thunb. v. *erecta* f. *sieboldii* (Miq.) Corner, var. *beecheyana* (Hook. et Arn) King f. *koshunensis* (Hayata) Corner.—*F. gasparriniana* Miq. v. *esquirolii* (Lévl. et Vant.) Corner, v. *laceratifolia* (Lévl. et Vant.) Corner, v. *viridescens* (Lévl. et Vant.) Corner.—*F. stenophylla*

Hemsl. v. *macropodocarpa* (Lévl. et Vant.) Corner, v. *nhatrangensis* (Gagnep.) Corner.—*F. ischnopoda* Miq. v. *subcylindrica.*—*F. pustulata* Elmer v. *lanceifolia* (Sata) Corner.—*F. grossularioides* Burm. f. v. *robusta,* v. *stenoloba.*—*F. hirta* Vahl v. *appressa,* v. *brevipila,* v. *dumosa* (King) Corner, v. *malayana,* v. *squamosa.*—*F. simplicissima* Lour. v. *annamica* (Gagnep.) Corner.—*F. fulva* Reinw. v. *timorensis.*—*F. glandulifera* Wall. v. *camiguinensis* (Merr.) Corner, v. *villosa.*—*F. chartacea* Wall. v. *lanceolata.*—*F. tuphapensis* Drake v. *annamensis* (Gagnep.) Corner.—*F. aurata* Miq. v. *brevipilosa,* v. *longipilosa,* v. *palawanensis,* v. *pedunculata.*—*F. macilenta* King v. *gibbsiae* (Ridley) Corner, v. *ilicifolia.*—*F. setiflora* Stapf v. *adelpha,* v. *puberula.*

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subgen. Ficus

subgen. *Eusyce* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 289.—subgen. *Carica* Mildbr. et Bur., Engl. Bot. Jahrb. 46 (1912) 174.—subgen. *Metamorphe* Sata J. Sci. Tr. Agr. Taiwan 6 (1934) 19.—subgen. *Eumetamorphe* Sata, Monogr. (1944) 244.—subgen. *Caricae* Sata, Monogr. (1944) pt. 4, 179.—Dioecious. Interfloral bracts absent. Style of gall-flowers much shorter than that of the female; female stigma simple or bifid, gall-stigma simple and, often, more or less infundibuliform. East Africa, Asia, Australasia, 312 spp.

I distinguish eight sections:—

sect. *Ficus,* sect. *Rhizocladus* Endl., sect. *Kalosyce* Miq. (sect. *Synoecia* Miq.), sect. *Sinosycidium* sect. nov., sect. *Neomorphe* King, sect. *Sycocarpus* Miq. (sect. *Covellia* auct.), sect. *Sycidium* Miq., sect. *Adenosperma* Corner.

sect. Ficus

This is the group with bistaminate male flowers which has *F. carica* Linn. as its type. I divide it into two subsections, each with several series. These subsections are so different in detail that they appear worthy of sectional rank. There are, however, a few species in South China and Indochina which come between them and in some way bridge the differences. Hence I adopt the more conservative classification.

subsect. **Ficus.**—Semina laevia, non v. vix carinata. Tepala plerumque glabra. Flores masculi ostiolares v. dispersi, antheris non mucronatis. Lamina cystolithis praedita. Glandulae microscopicae capitatae, cellulis 2–4, v. flabelliformes. East Africa usque ad Japan et New Guinea, 31 spp. Typus, *F. carica* Linn.

ser. **Rivulares** Corner ser. nov.—Semina compressa, auriculiformia. Perianthium cupulare 2–4-lobatum, ovario albido plus minus obtegens. Flores masculi ostiolares, staminibus (1–) 2. Stigma simplex. Receptacula axillaria, solitaria. Cystolitha hypogena. Ins. Philippines, 1 sp. *F. rivularis* Merr.

ser. **Pseudopalmeae** Corner ser. nov.—*Ficus* sect. *Pseudopalma* Elmer, Leafl. Philip. Bot. 1 (1908) 283.—Semina lentiformia. Flores sessiles, masculi ostiolares. Tepala libera. Ovarium cecidiophorum rufo-brunneum longistipitatum. Arbuscula pachycaulis sparsim ramosa, foliis magnis brevipetiolatis grosse dentatis. Cystolitha amphigena. Ins. Philippines, 1 sp. *F. pseudopalma* Blanco.

ser. **Sinosyceae** Corner ser. nov.—Semina lentiformia. Tepala libera, rubra v. albida. Flores masculi ostiolares v. dispersi, staminibus 1–5. Receptacula plerumque solitaria, axillaria. Stipulae binatae. Cystolitha amphigena. India, Burma, China, Indochina, Thailand, 2 spp. *F. henryi* Diels, typus, et *F. subincisa* B. Ham. ex J. E. Sm. (*F. clavata* Wall. ex Miq.).

ser. **Cariceae** Corner ser. nov.—Semina lentiformia. Tepala libera, albida v. carnea, membranacea. Flores masculi ordinibus numerosis ostiolares, raro etiam dispersi: staminibus 2–4. Receptacula plerumque solitaria, axillaria. Folia palmato-lobata v. ovatocordata, plerumque dentata. Cystolitha hypogena. East Africa, Asia Minor, Pakistan, India, Bonin Isl., 3 spp. *F. carica* Linn. (typus), *F. palmata* Forsk., *F. iidaiana* Wilson.

ser. **Erythrogyneae** Corner ser. nov.—*Erythrogyne* Vis. ex Gasp. Parl. Giorn. Bot. 2 (1844) 219; Ann. Sci. Nat. ser. 3, 3 (1845) 348.—*Ficus* sect. *Erythrogynae* (Vis.) Endl. Gen. Pl. Suppl. 4, 2 (1847) 34.—subgen. *Erythrogyne* (Vis.) Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 289.—Semina magna reniformia, 2.5–6 mm. longa, vix carinata, per receptaculum pauca: cotyledones conduplicatae. Tepala libera rubra, ovario femineo semper multo breviora. Flores masculi ostiolares. Ovarium cecidiophorum saepe crustaceum et rugoso-angulatum. Frutices v. arbusculae, saepe epiphyticae, haud sarmentosae. Folia acutilanceolata et penninervia, vel obtusa costa dichotoma, integra. Cystolitha hypogena. Western Malaysia, 2 spp. *F. deltoidea* Jack (typus), *F. oleaefolia* King.

ser. **Podosyceae** Corner ser. nov.—*Ficus* sect. *Podosycea* Miq. Hook. Lond. J. Bot. 7 (1848) 442.—sect. *Didymophora* Miq. et sect. *Thamnosycea* Miq., id. 453, 454.—sect. *Eusyce* (Miq.) King subsect. *Frutescentiae* Sata, Monogr. (1944), 332, 385 (lectotypus, *F. pedunculosa* Miq.).—Semina 1–3 mm. longa, lentiformia v. reniformia, per receptaculum numerosa. Tepala libera, raro

conjuncta, rubra, ovario femineo equalia v. breviora. Flores masculi dispersi, raro solum ostiolares. Frutices v. arbores, raro epiphyticae sed nonnullae repentes. Asia, Malaysia, 22 spp. Typus, *F. pedunculosa* Miq.

subser. **Podosyceae.**—Flores cecidiophori et sessiles et pedicellati, tepalis ovario sessili v. substipitato plus minus equalibus. Flores feminei tepalis ovario longioribus v. brevioribus. 10 spp. Typus, *F. pedunculosa* Miq.

subser. **Basitepalae** Corner.—Flores cecidiophori plus minus sessiles, tepalis ovario longistipitato multo brevioribus, ut in floribus femineis. Sinohimalaya, Philippines, 4 spp. Typus, *F. abelii* Miq.

subsect. **Eriosycea** (Miq.) Corner subsect. nov.—*Ficus* sect. *Eriosycea* Miq. Hook. Lond. J. Bot. 7 (1848) 455; emend. Miq. Fl. Ind. Bat. I, 2 (1859) 293; Ann. Mus. Bot. Lugd. Bat. 3 (1867) 290.—sect. *Trichosycea* Miq. Fl. Ind. Bat. I, 2 (1859) 296; Ann. Mus. Bot. Lugd. Bat. 3 (1867) 290.—Semina plerumque tuberculata v. echinata, carinata et basi duplice carinata, haud compressa. Tepala rubra v. albido-ochracea et setosa. Flores masculi ostiolares: staminibus 2, 1–2, vel 1, antheris breviter mucronatis v. modo acutis. Cystolitha nulla. Glandulae microscopicae capitatae, cellulis plerumque numerosis. Frutices v. arbores, haud epiphyticae, foliis saepe palmato-lobatis praecipue juvenilibus. Asia, New Guinea, 28 spp. Typus, *F. grossularioides* Burm. f.

ser. **Eriosyceae** Corner ser. nov.—Tepala rubra 3–7, plerumque 4–5, glabra v. apice marginibusque ciliolatis. Stamina et ovaria saepe basi setulis circumdata. 19 spp. Typus, *F. grossularioides* Burm. f.

subser. **Eriosyceae.**—Folia subtus areolis obscuratis pilis undulatis albidis griseis v. fulvis lanata, juvenilia plerumque palmato-lobata. China, Indochina, Thailand, West Malaysia, 3 spp. Typus, *F. grossularioides* Burm. f.

subser. **Trichosyceæ** Corner subser. nov.—sect. *Trichosycea* Miq. l.c.—Folia subtus haud lanata, areolis haud obscuratis, dentata v. denticulata, juvenilia saepe palmato-lobata. India, China, usque ad ins. Moluccanas, 7 spp. Typus, *F. hirta* Vahl.

subser. **Dehiscentes** Corner subser. nov.—Folia subtus haud lanata, integra, intercostis numerosis strictis, juvenilia raro palmato-lobata. Receptacula cecidiophora irregulariter dehiscentia, maturitate viridia v. flavescentia, feminea rubra indehiscentia. India usque ad New Guinea, 3 spp. Typus, *F. glandulifera* Wall. ex Miq.

subser. **Cuneifoliae** Corner subser. nov.—Folia subtus haud lanata, parviuscula integra, intercostis paucis et saepe laxis, basi cuneata, brevipetiolata, juvenilia haud v. raro palmato-lobata. Receptacula cecidiophora ut feminea rubescentia indehiscentia. Stamina 1–2, vel 1, antheris haud mucronatis. India, China, Indochina, Thailand, Malaya, Sumatra, Borneo, 3 spp. Typus, *F. chartacea* Wall. ex King.

ser. **Auratae** Corner ser. nov.—Flores feminei et cecidiophori tepalis 3–4 (–5) albidis v. ochraceis dense setosis. Setulae c. stamina et ovaria plerumque deficientes. Setae internae copiosissimae rigidae. Indochina, Thailand, Malaya, Sumatra, Borneo, Palawan, 9 spp. Typus, *F. aurata* Miq.

subser. **Auratae.**—Flores masculi ordinibus numerosis ostiolares, sessiles et pedicellati, tepalis haud setosis, staminibus 2. Receptacula 10–26 mm. lata, plerumque sessilia. Lamina majuscula. 4 spp. Typus, *F. aurata* Miq.

subser. **Monandreae** Corner subser. nov.—Flores masculi ordine uno ostiolares sessiles, v. etiam ordine secundo pedicellati, tepalis albido-setosis ut in floribus cecidiophoris, stamine uno. Receptacula 10–16 mm. lata, sessilia v. pedunculata. Lamina saepe minuscula. Borneo, 5 spp. Typus, *F. setiflora* Stapf.

subsect. Ficus ser. Sinosyceae Corner

F. subincisa B. Ham. ex J.E. Sm. Rees Cyclop. 14 (1810) n. 91.—*F. chincha* Roxb. Fl. Ind. 3 (1832) 534.—*F. clavata* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 431.—*F. caudata* Griff. Ic. Pl. As. (1854) t. 557 (i).—The type of *F. subincisa* is in the herbarium of the Linnean Society of London (n. 1610.42), and there is a specimen of *F. chincha* named by Roxburgh in the Martius herbarium at Brussels. They leave no doubt that they are earlier names for the same species as *F. clavata* Wall.

subsect. Ficus ser. Erythrogyneae Corner

F. deltoidea Jack, Mal. Misc. 2 (1822) 71; Merrill, J. Arn. Arb. 33 (1952) 225.—This common shrub of Western Malaysia is now represented in herbaria by more than 600 collections, and I have myself studied many more living plants. Superficially there is bewildering diversity, but attention to detail has lead me to distinguish twelve varieties. Most of these appear to have geographical delimitation which it should not be difficult to check because the plants are easy to recognise and to gather. It is

however, necessary to collect gall-plants as well as the seed-plants, because diagnostic characters lie in the gall-ovary and tepals: in a few varieties it is impossible to classify seed-plants. *F. diversifolia* Bl. is the common Javanese mountain shrub known, through cultivation in Europe, as var. *lutescens* Desf., specimens of which are preserved in the herbaria at Paris, Kew, and Florence; Blume's type is at Leiden. Of Jack's two species, *F. ovoidea* and *F. deltoidea*, the first is authenticated by Wallich 4526 from Penang, labelled *F. ovoidea* Jack: King made this var. *ovoidea* which is antedated by var. *angustifolia* Miq. There remains the identity of *F. deltoidea*. Jack did not mention penni-nerved leaves, which he would surely have done if he had been describing var. *lutescens*. Hence I identify his plant with that of Sumatran and Malayan lowlands which lack the penninerved leaves in the adult state: his description agrees, but lacks other details diagnostic of particular varieties.

var. **angustifolia** (Miq.) Corner comb. nov.—*Synoecia diversifolia* (Bl.) Miq. v. *angustifolia* Miq. Pl. Jungh. (1851) 67.—*F. ovoidea* Jack. Mal. Misc. 2 (1822) 71.—*F. diversifolia* v. *ovoidea* (Jack) King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 140, pl. 174D.—Miquel's type, at Leiden, shows that it is the narrow spathulate-leafed variety of *F. deltoidea*.

f. **angustissima** Corner f. nov.—Ramuli 1–1.5 mm. crassi. Lamina 2–3.3 × 0.5–1 cm., anguste spathulata, costa sub mediam laminae dichotoma. Receptacula 5 × 3–4 mm., pedunculo 2–5 mm. longo. Semina 1–2 per receptaculum. Mentawei Isl.

H.H. B.B. 639 (Batoe), Iboet 259 (Siberut), Sing. F.n. 14753 (Sipora, *typus* herb. Singapore).

var. **arenaria** Corner v. nov.—Frutex –2 m. altus. Lamina 2.5–11 × 1.8–4 cm., plerumque elliptica v. anguste obovata, acuta v. subacuminata, penninervia, costis lateralibus utrinsecus 3–5: folia superiora pauca obovata, obtusa, costa ad v. super mediam laminae dichotoma. Receptacula 10–12 × 7–9 mm., ellipsoidea, v. 7–9 mm. lata subglobosa: pedunculo 1–9 mm. longo. Flores cecidiophori tepalis ovario angulato tenuiter crustaceo multo brevioribus. Borneo, ad terram arenosam.

Alston 13092 (Sampit); Brunei 5352 (Kuala Belait, *typus* herb. Cambridge), 5367 (Badas); Bur. Sci. 290 (Sandakan); Dunselman 103 (Singkawang); Hose 211 (Sarawak, Marudi, Baram); Purseglove 5024 (Bako National Park); Richards 2644, 2645 (Marudi, Sarawak).

This is like v. *intermedia* and v. *motleyana,* but differs from both in the short gall-tepals. Thus it suggests v. *deltoidea* but its leaves are mostly acute as in v. *motleyana.* I have seen many plants in the *kerangas*-vegetation in Sarawak and Brunei and consider that it is usefully distinguished.

var. **bilobata** Corner v. nov.—Frutex v. arbuscula –5 m. altus. Lamina 2–7 × 1–3.5 cm., spathulato-obovata v. obdeltoidea, apice saepe breviter bilobata, costa ad v. infra mediam dichotoma: glandula ad furcam costae, basalibus 2 v. nullis, aliquando glandulis parvis ad furcas nervorum: petiolo 3–25 mm. Receptacula 5–8 mm. lata, pedunculo 2–10 mm. longo. Tepala cecidiophora ovario rugoso-angulato equalia. Malaya (Selangor, Pahang, Perak, Kedah) in silvis montanis 1000–2000 m. alt. et ad cacumina collium calcareorum.

Sing. F.n. 2368 (Taiping Hill, *typus,* herb. Singapore), 8443, 11077, 19701, 29689, 32551, 38028, 38708; Ridley 7628; Haniff 3908; King's Coll. 2430; Scortechini 308; Wray 1099; Yapp 488.

This approaches v. *intermedia,* v. *kunstleri,* v. *lutescens,* and v. *trengganuensis,* but cannot be placed satisfactorily with any. It requires field-study. Possibly all these varieties converge to this effect in their high mountain forms.

var. **borneensis** Corner v. nov.—Ramuli 2–5 mm. crassi. Lamina 4.5–13 × 3–9 cm., obovata, obtusa v. subrotundata, costa plus minus ad mediam dichotoma, foliis ad basim caulis solo acutis penninerviis: glandulis 2 basalibus, raro ad furcam costae: petiolo 4–25 mm. longo, 3–4 mm. crasso. Receptacula 8–12 mm. lata (11–16 mm., viva), pedunculo 0.5–6 mm. longo: bracteis basalibus 2–2.5 × 3–4 mm. Flores cecidiophori sessiles v. breviter pedicellati: tepalis ovario valde rugoso-angulato sessili v. longistipitato multo brevioribus. Borneo.

Amdjak 492; Anderson 9754; Brunei 649; Dunselman 90; Endert 3920 (West Koetei, Mt. Kemoel, *typus* herb. Leiden); Hallier 1372, 2240; Sahib 16321; Sales 774; Sing. F.n. 27370; S. 4807, 5856, 9953.

This appears to be widely distributed in all parts of Borneo from the lowlands to an altitude of 1,500 m. In the large leaf and fig it approaches v. *kunstleri* (not known from Borneo), but differs in the short peduncle, short gall-tepals, and the fewer leaf-glands. Thus it is, in fact, an enlarged state of v. *deltoidea.*

f. **subhirsuta** Corner f. nov.—Receptacula tenuiter appresse pilosa, aliquando etiam ramuli. Sarawak, S. Borneo.

Beccari 274, 815, 1246; Clemens 21907 (Gat, Upper Rejang River, *typus* herb. Br. Mus.); Sarawak Mus. 4807; Teysmann 7118.

Varietates *F. deltoideae* praecipue glabrae.

var. **intermedia** Corner v. nov.—*F. kinabaluensis* Stapf, Tr. Linn. Soc. Bot. ser. 2, 4 (1894) 226.—*F. burkillii* Ridl. Fl. Mal. Pen. 3 (1924) 330.—Frutex –4 m. alta. Folia plerumque dimorpha, penninervia ut in v. *motleyana*, vel lamina obtusa spathulata 3–10 × 1.5–5.5 cm., semper longiori quam lata, costa super mediam, saepe prope apicem, dichotoma: glandulis 2 basalibus: petiolo 2–15 mm. Receptacula rubra dein nigro-purpurea, 6–10 mm. lata, subglobosa: pedunculo 1–11 (–15) mm.: bracteis basalibus 1–2 mm. longis. Flores cecidiophori tepalis ligulatis v. lanceolatis ovario laevi v. leviter subangulato longioribus. Malaya, Borneo, (? Celebes), in silvis montanis 800–2,600 m. alt. saepe epiphytica. *Typus*, Purseglove 4281 (Pahang, Fraser's Hill, herb. Singapore).

I distinguished this variety because it comes between v. *motleyana* and v. *lutescens* and predominates in Malayan mountains where neither of these varieties occurs. The differences from v. *motleyana* are the more coriaceous leaf, the subglobose fig, the smooth gall-ovary, and the greater production of obtuse leaves with dichotomous midrib. On Mt. Kinabalu it seems that these obtuse leaves are few, and specimens exactly like those of *F. kinabaluensis* have been collected from G. Tahan in Malaya. Generally, in Malaya abundant obovate obtuse leaves are formed and this is *F. burkilii*.

All the numerous collections from Malaya identified as *F. deltoidea* (or *F. diversifolia*) v. *lutescens* belong here and, also, the following from Borneo:—

Clemens 10700, 10996, 20161, 28787, 28932, 29257, 29916, 30292, 30294, 30296, 30766, 30988, 31503, 31665, 32936, 32937, 32940, 33193, 33625, 33830, 40696, 50635, 51082. Endert 3912, 3917. Haviland 1215, 1216. Purseglove 5024. San. 17580. Sing. F.n. 12209, 26400, 27524, 27695, 27714, 28007. SK 29, 136.

var. **kunstleri** (King) Corner comb. nov.—*F. diversifolia* Bl. v. *kunstleri* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 140, pl. 175 A, B.

var. **lutescens** (Desf.) Corner comb. nov.—*F. diversifolia* Bl. Bijdr. (1825) 456.—*F. lutescens* Desf. Cat. ed. 3 (1829) 413.—*F. diversifolia* Bl. v. *lutescens* (Desf.) King, Ann R. Bot. Calc. 1,

2 (1888) 140.—This is the Javanese and Sumatran plant with the obtuse leaves broad and with the midrib dichotomous at or below the middle.

f. **longipedunculata** Corner f. nov.—(*F. diversifolia* Bl. v. *longipedunculata* Miq. ined.).—Pedunculi 14–30 mm. longi. Java, Sumatra.

Sumatra:—Beccari 190 (Mt. Singalan); Bunnemeyer 5629 (G. Gombah), 9187 (G. Koerintji, *typus* herb. Leiden); Meijer 5008 (Mt. Sago); v. Steenis 3669 (G. Pesagi).

Java:—Backer 8677, 25722, 25941; Blume s.n. (G. Salak); Coert 689; Harreveld 1961; Herb. Junghuhn s.n. (G. Gedeh), n. 177, et s.n. (Hoch Ankola); Koorders 9404, 9406, 26491, 26812; Schiffner s.n. (1872); de Vriese s.n. (det. v. longipedunculata Miq. ms., ? Java, ? Sumatra).

f. **subsessilis** (Miq.) Corner comb. nov.—*F. diversifolia* Bl. v. *subsessilis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 268, 289.—Pedunculi 0–4 mm. longi. Java, Sumatra.

This is represented by many collections. The type (de Vriese, Batjan, herb. Leiden, herb. Utrecht) was said to come from the Moluccas, but these lie outside the range of the species and, I think, this was an error for Java.

var. **motleyana** (Miq.) Corner comb. nov.—*F. motleyana* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 228, 294.—The typical form of *F. motleyana* with oblong, shortly pedunculate fig and only lanceolate, acute, penninerved leaves seems specifically distinct, but *F. deltoidea* v. *intermedia* provides so many intermediates that it is almost impossible to draw a line between them in the herbarium.

var. **obligoneura** (Miq.) Corner comb. nov.—*F. oligoneura* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 289.—*Urostigma oligoneuron* Miq. Fl. Ind. Bat. Suppl. (1860) 438.—This is close to v. *lutescens* but has larger figs and long-pedicellate gall-flowers. Its leaf is extremely variable.

v. **peltata** Corner v. nov.—Frutex repens gracilis, internodis elongatis. Lamina 1.5–2.7 cm. lata, suborbicularis, anguste peltata, costa infra mediam dichotoma: glandulis 3, (2 basalibus, 1 ad furcam costae): petiolo 10–18 × 1 mm. Receptacula 8 × 5 mm., ellipsoidea: pedunculo 1–1.5 mm. longo: pedicello 2–3 mm. longo: Flores cecidiophori sessiles v. pedicellati: tepalis 4–5 ligulatis, ovario laevi equalibus v. longioribus. Sumatra (Mt. Sago, Harau Canyon, ad scopulos).

Meijer 3980 (*typus,* herb. Cambridge); Jacobsen 2194.

Habitu repenti foliis suborbicularibus anguste peltatis distinctissima sed v. *lutescentis* affinis.

var. **trengganuensis** Corner v. nov.—Ramuli 2 mm. crassi. Lamina 2.3–8 × 1.8–5.5 cm., elliptica v. rotundato-obovata, etiam subbilobata, costa ad v. super mediam dichotoma: glandulis 3–4 (–5), 2 basalibus, ceteris ad furcas nervorum: petiolo 10–50 mm. longo. Receptacula 9–12 mm. lata (14–18 × 11–14 mm., viva), roseo-rubra dein nigro-purpurea: pedunculo 6–20 × 1.5 mm.: bracteis basalibus 1–1.5 mm. longis. Flores cecidiophori sessiles v. pedicellis –1.5 mm. longis praediti: tepalis 3–4, lanceolatis v. ligulatis ovario rugoso-angulato equalibus, saepe pilo apicali praeditis. Malaya (Trengganu, Pahang costa orientali) in locis arenosis et montanis, terrestris v. epiphytica.

Cons. For. 3112: Kep. F.n. 37354; Ridley 1401, 1444; Sing. F.n. 15346, 17458, 17515, 25841, 30079 (*typus,* herb. Singapore), 31039, 31075, 39914, 40405; Vesterdal 284.

Inter v. *kunstleri* et v. *intermediam* sed lamina elliptica obtusa.

F. oleaefolia King var. **dodonaeiformis** (Gagnep.) Corner comb. nov.—*F. dodonaeiformis* Gagnep. Lec. Notul Syst. 4 (1927) 90.

var. **epiphytica** (Elmer) Corner comb. nov.—*F. williamsii* C. B. Robinson Philip. J. Sci. Bot. 3 (1908) 177.—var. *epiphytica* Elmer, Leafl. Philip. Bot. 7 (1914) 2396.

var. **memecylifolia** Corner v. nov.—Frutex v. arbuscula –5 m. alta. Lamina 2–7 × 0.7–2.7 cm., lanceolato-elliptica, acuminata, saepe obtusiuscule: petiolo 1–7 mm. longo. Receptacula cecidiophora 4–5 mm. lata, subglobosa, feminea 4–7 × 3–6 mm. ellipsoidea: pedunculo 3–14 × 0.5 mm. Flores cecidiophori tepalis ovario valde angulato plerumque brevioribus. Semina 4 mm. longa, 1–4 per receptaculum. Borneo, Celebes, in silvis montanis muscosis 900–2000 m. alt., saepe epiphytica.

A v. *oleaefolia* pedunculo longiori gracillimi et a v. *myrsinoide* lamina acuminata differt.

Borneo:—Bur. Sci. 2027; Clemens 20696, 27939 (*typus,* herb. Br. Mus.) 26708, 28758, 30570, 31276, 34010, 40741; Endert 3837, 4268, 4398; For. Dept. B.N.B. A4461; Hallier 2673, 3421; Haviland 87; Pickles 3701, 3772; San. A4173; Sing. F.n. 26338, 27817. Celebes:—Kjellberg 1668 (Makale), 2310 (B. Wawoe Meoesa), 2728 (Porema); NIFS 227 (0. Masamba Lemboeng).

var. **myrsinoides** Corner v. nov.—Frutex v. arbor –13 m. alta, trunco –20 mm. crasso. Lamina 2.5–9 × 0.8–3 cm., spathulata v. anguste obovata, apice obtusa v. rotundata: petiolo 1–10

mm. Receptacula cecidiophora 5–6 mm. lata subglobosa, feminea 7 × 4–5 mm. ellipsoidea: pedunculo 1.5–8 × 0.7 mm. Flores cecidiophori tepalis ovario laevi v. subangulato equalibus v. longioribus. Semina 3–4 mm. longa, 1–3 per receptaculum. Borneo, in silvis montanis muscosis 500–2100 m. alt., saepe epiphytica.

Kinabalu:—Clemens 11005, 29529, 29915, 29930, 31410, 31863, 32490, 32671, 32936, 40087, 40968; Sing. F.n. 26977, 27546, 27550 (*typus,* herb. Singapore); San. A4228; Sinclair 9058. Sarawak:—SK 87 (Merurong Plateau). Indonesian Borneo:—Amdjah 490 (Batoe Lesseng).

Receptaculo parvo gracile pedunculato, foliis obtusis distincta.

var. **riparia** Corner v. nov.—Frutex riparius. Lamina 6–9 × 1.5–2 cm., lanceolata, acuta v. breviter acuminata: costis lateralibus utrinsecus 13–16: petiolo 2–5 mm. Receptacula cecidiophora 5–6 mm. lata subglobosa: pedunculo 15–20 × 0.7 mm. Flores cecidiophori tepalis ovario angulato brevioribus v. longioribus. Sarawak (Upper Baram River, 200 m. alt., Sing. F.n. 6871, *typus* herb. Singapore).

sect. Ficus ser. Podosyceae Corner subser. Podosyceae

F. neriifolia J.E. Sm. Rees Cyclop. 14 (1810) n. 21.—*F. gemella* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 454.—*F. nemoralis* Wall. ex Miq. var. *gemella* (Wall. ex Miq.) King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 162, pl. 206.—Smith's type (n. 1610. 39) in the herbarium of the Linnean Society of London is this characteristic plant with thick-walled fig.

var. **fieldingii** (Miq.) Corner comb. nov.—*F. nemoralis* Wall. ex Miq. var. *fieldingii* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 163.—*F. fieldingii* Miq. Hook. Lond. J. Bot. 7 (1848) 439.

var. **nemoralis** (Wall. ex Miq.) Corner comb. nov.—*F. nemoralis* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 453.

var. **trilepis** (King) Corner comb. nov.—*F. nemoralis* Wall. var. *trilepis* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 162.—*F. trilepis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 228, 294.

F. pedunculosa Miq. var. **confertifolia** (Merr.) Corner comb. nov.—*F. confertifolia* Merr. Philip. J. Sci. 18 (1921) 59.

var. **imberbis** (Elmer) Corner comb. nov.—*F. luzonensis* Merr. var. *imberbis* Elmer, Leafl. Philip. Bot. 4 (1911) 1323.

var. **macropoda** (Miq.) Corner comb. nov.—*F. macropoda* Miq. Hook. Lond. J. Bot. 7 (1848) 442.

var. **mearnsii** (Merr.) Corner comb. nov.—*F. mearnsii* Merr. Philip. J. Sci. Bot. 3 (1908) 402.

var. **segaarensis** (Engl.) Corner comb. nov.—*F. segaarensis* Engl. Bot. Jahrb. 7 (1886) 453.

var. **velutina** Corner var. nov.—Hispido-villosa pilis brunneis 0.5 mm. longis mollibus, lamina supra tenuiter villosa. Lamina –13 × 6 cm., elliptico-obovata, breviter acuminata, acuta, basi anguste subcordata v. cuneata: costis lateralibus utrinsecus 6–8, basalibus ad ¼ laminae elongatis: petiolo –20 mm. longo. Receptacula ellipsoidea 12–15 mm. lata: pedunculo 30–40 mm.: pedicello 4–5 mm.: setis internis copiosis. Flores masculi dispersi. Burma (Toong Dong, Wallich 4528, *typus* herb. Kew).

In view of the numerous collections of *F. pedunculosa,* these species can now be treated only as varieties. The species extends from Formosa to New Guinea but in Malaysia it is not to the west of Celebes. The sole collection of v. *velutina* from Burma is therefore exceptional and needs further collecting.

F. erecta Thunb. var. **erecta** f. **sieboldii** (Miq.) Corner comb. nov.—*F. sieboldii* Miq. Ann. Mus. Bot. Lugd. Bat. 2 (1866) 199.—*F. erecta* Thunb. var. *sieboldii* (Miq.) King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 142, pl. 178B.

var. **beecheyana** (Hook. et Arn.) King f. **koshunensis** (Hayata) Corner comb. nov.—*F. koshunensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30 (1911) 276.—*F. beecheyana* Hook. et Arn. var. *koshunensis* (Hayata) Sata, J. Soc. Tr. Agr. 6 (1934) 22.

F. trivia Corner sp. nov.—*F. cuneata* Lévl. et Vant. Fedde's Rep. 4 (1907) 84, pr. p. Bodinier 2363 (alt. p. = *F. heteromorpha* Hemsl.).—Frutex v. arbor –7 m. alta, foliis longipetiolatis spiraliter dispositis. Ramuli glabri v. puberuli: petioli et costae (subtus) pilis fulvidulis patentibus 0.5–1.5 mm. longis sparsim puberuli, v. subglabri. Ramuli 2.5–4 mm. crassi, brunnei. Stipulae 6–15 mm. longae, appresse pilosae v. pilis patentibus. Lamina 5–18 × 2.3–10 cm., elliptica v. obovata, angustior ad ramulos superiores, apice acuta v. breviter acuminata –10 mm. longo, basi cuneata, integra, laevis, membranacea v. subcoriacea, sicco obscure viridis v. brunneola: costis lateralibus utrinsecus 4–7, v. 3–4 in foliis minoribus, obliquis, intercostis laxis 2–5, subtus leviter elevatis: costis basalibus utrinsecus 1–2, ad ½ laminae elongatis, glandulis basalibus 2: petiolo 9–70 mm. longo. Receptacula axillaria binata, maturitate rubra v. purpurea: pedunculo 3–8 mm. longo, glabro. v. puberulo: bracteis basalibus 3, 1–1.5 mm. longis, acutis, puberulis: corpore receptaculi

8–10 mm. lato, subgloboso v. subellipsoideo, ostiolo bracteis 3 planis ut disco 1.5–2 mm. lato occluso: setis internis nullis v. paucis minutis: cellulis scleroticis nullis. Flores masculi pedicellati, ostiolares et dispersi, cecidiophoris equales v. longiores: staminibus 2. Flores cecidiophori sessiles v. pedicellati: tepalis ovario albido sessili v. substipitato longioribus. Flores feminei sessiles, tepalis ovario brevioribus: stylo glabro, stigmate obliqua, haud bifido. Semina 2 × 1.5 × 1.3 mm., subreniformia, vix carinata, laevia. Cystolitha hypogena. China, Tonkin, in silvis montanis.

F. chapaensis Gagnep. affinis sed stipula hirta, lamina laevi, pedunculo longiori differt.

China:—Bodinier 2363 (Kweichou); Cavalerie 7809, 7810 (Kweichou); Esquirol 2053 (Kweichou); Ford 175, 177 (Kwangtung); A. N. Steward et H. C. Cheo 446 (Kwangsi, Ling Yuen Hsien); Y. W. Taam 59 (Kwangsi, pr. Pai Shou); Y. Tsiang 6827 (Kweichou); T. M. Tsui 523, 716 (Kwangtung, Yang Shan, pr. Linchow). Indochina:—Bon 2709 (Tonkin, Dong Ham valley, *typus* herb. Paris).

F. gasparriniana Miq. Hook. Lond. J. Bot. 7 (1848) 436.—*F. silhetensis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 223, 291. —The type at Kew, though poor, leaves no doubt that it is the earlier name for *F. silhetensis,* a variable species.

var. **esquirolii** (Lévl. et Vant.) Corner comb. nov.—*F. esquirolii* Lévl. et Vant. Fedde's Rep. 4 (1907) 84.—This is a variety with lanceolate multicostate lamina.

Cavalerie 125, 129; Decker 144; Esquirol 2588 (*typus*); Faber 446; Y. Tsiang 1471, 6053; T. M. Tsui 643; E. H. Wilson 2789.

var. **laceratifolia** (Lévl. et Vant.) Corner comb. nov.—*F. laceratifolia* Lévl. et Vant. Fedde's Rep. 4 (1907) 85.—*F. rhomboidalis* Lévl. Fl. Kouy-Tcheou (1915) 433.—This is a form with lobed dentate leaves and, to judge from herbarium material of v. *gasparriniana,* it is not its sapling state.

Bodinier 1663 (*typus*); Cavalerie 420, 7813, 7814; Ducloux 2202; Esquirol 3267 (*typus, F. rhomboidalis*), 6365; Faber 444; W. P. Fang 2415, 5645; Henry 12090; W. R. Price 1268; A. N. Steward et H. C. Cheo 598.

var. **viridescens** (Lévl. et Vant.) Corner comb. nov.—*F. cyanus* Lévl. et Vant., et v. *viridescens* Lévl. et Vant. Fedde's Rep. 4 (1907) 84.—This is the more villous state of *F. gasparriniana,* which seems commoner at higher altitudes. There are many collections.

F. stenophylla Hemsl. emend. Rehder, J. Arn. Arb. 17 (1936) 79, 80.—var. **macropodocarpa** (Lévl. et Vant.) Corner comb. nov. —*F. macropodocarpa* Lévl. et Vant. Fedde's Rep. 4 (1907) 66. —This is a state with long peduncles (13–55 mm.).

China:—Cavalerie 3589, 7812; Esquirol 838, 2216; A. N. Steward et H. C. Cheo 833. Laos:—Poilane 1880. Annam:—Poilane 6584, 29168.

var. **nhatrangensis** (Gagnep.) Corner comb. nov.—*F. nhatrangensis* Gagnep. Lec. Notul. Syst. 4 (1927) 92.—This differs in the broader lamina (4–16 × 1.5–5 cm.) with fewer pairs of lateral nerves (5–10).

Poilane 3431 (*typus,* Nhatrang); Chevalier 38658 (Nhatrang) (? Kostermans 390, Thailand).

F. ischnopoda Miq. var. **subcylindrica** Corner v. nov.—Receptacula corpore 20–30 × 7–10 mm., subcylindrico: pedunculo 10–25 mm. longo. Annam (Tourane, Clemens 3442, *typus* herb. Kew, et 4009). Receptacula matura, floribus masculis apertis, non juvenilia.

subsect. Ficus ser. Podosyceae Corner subser. Basitepalae Corner

F. pustulata Elmer var. **lanceifolia** (Sata) Corner comb. nov.—*F. cardinalicarpa* Elmer, Leafl. Philip. Bot. 4 (1912) 1391.—var. *lanceifolia* Sata et v. *linearifolia* Sata, Monogr. (1944) 356. This differs from v. *pustulata* only in the lanceolate multicostate leaf.

subsect. Eriosycea (Miq.) Corner ser. Eriosyceae Corner subser. Eriosyceae

F. grossularioides Burm. f. Fl. Ind. (1768) 227.—*F. alba* Reinw. ex Bl. Bijdr. (1825) 467. var. **robusta** Corner v. nov.—Ramuli, petioli, costae (subtus) pilis fulvis patentibus 1–2.5 mm. longis hirsuti, glabrescentes. Ramuli 4–7 mm. crassi. Lamina major, ad ramulos fertiles saepe trilobata v. ovato-cordata. Receptacula 15–20 mm. lata (20–30 mm., viva): pedunculo 4–6 × 3–4 mm.: bracteis basalibus 3–4 mm. longis: setis internis copiosis. Flores feminei pedicellis – 6mm. longis praediti, stylo hirsuto. Malaya.

Pahang (Fraser's Hill, 1,200 m. alt.):—Sing. F.n. 33187 (*typus,* herb. Singapore), Purseglove 4317, Corner s.n. 10.viii. 37. Selangor:—Sing. F. N. 32970 (? Kuala Selangor).

Omnibus partibus robustior bene distincta.

var. **stenoloba** Corner v. nov.—Ut v. *grossularioides* sed lamina lanceolata- elliptica (–14 × 4 cm.), juvenilis anguste lanceolato-lobata (lobo medio 1–2.5 cm. lato). Sumatra, in silvis montanis 1,200 m. altis, praecipue ad clivis volcanicis.

Bartlett 8310 (Simeloengoen); Lorzing 4356, 6585, 8511 (*typus*, herb. Leiden), 9471, 9890 (Sibolangit); Ouwehaud 249; Teysmann 714 (pr. Siboga); v. d. Vecht s.n. 25. xii. 54 (Berastagi).

subsect. Eriosycea (Miq.) Corner ser. Eriosyceae Corner suber. Trichosyceae Corner

F. hirta Vahl. var. **appressa** Corner v. nov.—Ramuli pilis appressis 1–2 mm. longis, costa subtus 2–3 mm. longis, praediti. Receptacula pilis appressis vel patentibus praedita. Laos, North Thailand, in silvis montanis 500–1,300 m. alt.

Laos:—Poilane 20052, 20378, 26141 (*typus*, herb. Paris), 26347.—Thailand:—RFD 9552 (Chiengrai).

var. **brevipila** Corner v. nov.—Ramuli, petioli, costae (subtus), et receptacula pilis brunneolis patentibus –1 mm. longis villosi. Lamina 8–16 × 4.7–8.5 cm., obovata, basi cuneata, integra, supra subscabrida, subtus aspero-villosa: costis lateralibus utrinsecus 5–7, basalibus 1, ad 1/3–½ laminae elongatis: petiolo 11–23 mm. longo. Receptacula 12–15 mm. lata sessilia, dense villosa: bracteis basalibus 1.5–2 mm. longis: setis internis copiosis flavidulis. Pedicelli florum glabri. Yunnan, Annam, in silvis montanis 1,200–1,500 m. alt.

Kingdom Ward 12755 (Yunnan, Mong Hai); Poilane 4046 (Annam, Nhatrang, *typus* herb. Paris).

var. **dumosa** (King) Corner comb. nov.—*F. dumosa* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 151, pl. 190.—This differs merely in being thinly hispid-villous and in having for the most part palmately lobed leaves, few being simple. All collections come from the neighbourhood of G. Dempo and G. Raja in Sumatra. The Indochinese records are *F. hirta* v. *imberbis* Gagnep.

var. **malayana** Corner v. nov.—*F. cordata* Ridley, J. R. As. Soc. Str. Br. 57 (1911) 93.—Receptacula 12–25 × 10–16 mm. (18–33 × 15–22 mm., viva), conica, sessilia: bracteis basalibus 6–9 × 3–5 mm., caducis. Perianthium masculum et cecidiophorum plus minus cupulare, 3–4-dentatum. Pili 2–4 mm. longi. Nepal, Assam, Indochina, Thailand, Hainan, Malaya (Perak, Pahang), in silvis montanis 500–1,700 m. alt.

Inter v. *hirtam* et v. *roxburghii* (Miq.) King intermedia.

Nepal:—Stainton, Sykes, et Williams 5241 (Rupukot Tal.). Assam:—King's coll. s.n. (Lushai Hills, 1890), Hook. f. et Thomson s.n. (Khasia). Hainan:—C. I. Lei 118 (det. *F. fulva*). Laos:—Poilane 26246 (Huat Laos, inter M. Luong Nam Eh et M. Sing). Annam:—Poilane s.n. (prov. Quang Tri, Dong Iam Pe, 22. ix. 39). Thailand:—Kerr 701 (Chiengmai, Doi Sootep), 7614 (Pattani, Betong), 20134 (Kao Krading, Toi), Sing. F.n. 4704 (Kantang). Perak:—Ridley 14624 (type, *F. cordata*), Wray 3413. Pahang:—Purseglove 4264, For. Dept. 7776, Sing. F. n. 32571, Corner s.n. 10.viii. 37 (*typus*, herb. Singapore), Fraser's Hill: For. Dept. 28165, Kep. F.n. 30986, Ridley 13720, Sing. F.n. 10948, 33550, Cameron Highlands: Sing. F. n. 31911, Sungei Tahan.

var. **squamosa** Corner v. nov.—Ut. v. *roxburghii* (Miq.) King sed receptacula minora 20–25 mm. lata, v. –28 × 18–20 mm., bracteis lateralibus nonnullis crassiusculis 3–5 mm. longis praedita: bracteis basalibus 6–8 mm. longis, subcaducis. Ramuli et petioli pilis brunneis 2–6 mm. longis praediti: receptacula pilis brunneis 1–2 mm. longis sparsim hispida et pilis brevioribus pallidis villosa. Stylus glaber. Folia plerumque palmatolobata. Sumatra, in silvis montanis 1,000–1,600 m. alt.

Alston 15134 (Sidikalang, inter Lae Pondor et Silalahi; *typus*, herb. Br. Mus.); NIFS bb. 6851 (Karoland, Tongkok); O. Hagerup s.n. (Toba, 25.xi. 16); Ridley s.n. (Berastagi, 8.ii. 21).

Bracteis lateralibus in sect. *Fico singularis*.

F. simplicissima Lour. var. **annamica** (Gagnep.) Corner comb. nov.—*F. silhetensis* Miq. var. *annamica* Gagnep. Lec. Fl. Gen. I.-C. 5 (1928) 788.—*F. touranensis* Gagnep. Lec. Notul. Syst. 4 (1927) 97.

F. halmaherae Corner sp. nov.—Arbor –30 m. alta, foliis longipetiolatis spiraliter dispositis. Ramuli, petioli, costae (subtus) pilis rigidis fulvidulis (? irritantibus) 1–2 mm. longis hispidi, nervuli subtus pilis mollibus –0.5 mm. longis villosi, areolae glabrae. Ramuli 10–12 mm. crassi. Stipulae – 25 mm. longae, appresse pilosae. Lamina –20 cm. longa et lata (? multo major), ovata-cordata, acuminata, denticulata, membranacea: costis lateralibus utrinsecus 4–6, intercostis –12 subtus elevatis; costis basalibus utrinsecus 3–4, ad ½ laminae elongatis, glandulis basalibus 2: petiolo 100–160 mm. longo. Receptacula axillaria, binata, pedunculata, primo ut ramuli hispida dein pilis rigidis caducis molliter et breviter villosa: pedunculo 2.5–4 × 2.5–3

mm.: bracteis basalibus 1.5–2 mm. longis, appresse puberulis: corpore receptaculi –22 × 17 mm., ellipsoideo, ostiolo subdepresso bracteis apicalibus numerosis parvis appresse pilosis occluso; setis internis –1.5 mm. longis, flavidulis rigidis copiosis: cellulis in pariete receptaculi omnibus fibriformibus elongatis crasse tunicatis. Flores masculi ordinibus duobus ostiolares sessiles: staminibus 2, filamentis rubris. Flores cecidiophori sessiles v. pedicellis glabris albidis –2 mm. longis praediti. Flores feminei et semina ? Cystolitha nulla. Halmaheira (Gunong Sembilan, c. 600 m. alt., "common along path in forest"; Pleyte 369, *typus* herb. Leiden).

Ut arbor Hibiscus, forsan *F. mollissimae* Ridley (Malaya) affinis, sed cellulis fibriformibus in pariete receptaculi singularis.

F. fulva Reinw. ex Bl. var. **timorensis** Corner v. nov.—Semina laevia, vix carinata. Stylus glaber v. subpuberula. Setae receptaculi internae paucissimae, breves. Pedicelli florum femineorum glabri. Timor (Forbes 3444 et 3579, typus herb. Br. Mus.).

F. subfulva Corner sp. nov.—Arbor –7 m. alta, foliis spiraliter dispositis. Ramuli, petioli, et costae (subtus) pilis fulvidulis –0.5 mm. longis sparsim puberuli. Ramuli 4–6 mm. crassi. Stipulae –15 mm. longae, appresse pilosae. Lamina 10–25 × 5–11.5 cm., elliptica, apice acuminata –10 mm. longo, basi rotundato-subcordata v. cuneata, integra, margine saepe recurvata, plus minus rigide coriacea, utrimque scabrida, sicco brunnea: costis lateralibus utrinsecus 4–6, intercostis –10 subtus elevatis: costis basalibus utrinsecus 2–3, ad ½–2/3 laminae elongatis, glandulis basalibus 2: petiolo 12–50 mm. longo. Receptacula axillaria binata pedunculata, sparsim appresse puberula, glabrescentia, maturitate rubra (cecidiophora et feminea): pedunculo 4–10 mm.: bracteis basalibus 2–4 mm. longis, ovato-acutis, appresse pilosis: pedicello nullo: corpore receptaculi 10–12 mm. lato (14–16 × 16–20 mm., viva), globoso v. ellipsoideo, ostiolo bracteis apicalibus 3–5 planis occluso sed maturitate hiascenti: setis internis 2–4 mm. longis, flavidis rigidis copiosis: cellulis scleroticis copiosis. Pedicelli florum albido-setosi: tepala glabra rubra spathulata. Stamina 2. Stylus glaber. Semina 1.5 mm. longa, tuberculata, valde carinata. Cystolitha nulla. Borneo.

var. **subfulva.**—Kinabalu, Sing. F. n. 26612, 26642; G. Klam, Hallier 2349, *typus* herb. Leiden.

var. **villosula** Corner v. nov.—Costae, intercostae et nervuli reticulati subtus pilis fulvidulis –0.5 mm. longis dense villosuli. Setae internae 1–1.5 mm. longae: cellulis scleroticis nullis.

Hallier 2869 (*typus*, herb. Leiden) et 2977, Lianggagang; Haviland 85 (Braang); Beccari 962 (Kuching, det. *F. leucoptera* Miq.); Clemens 20698 (Sarawak, Bidi Cave).

F. auratae Miq. persimilis sed vero inter *F. fulvam* et *F. glandulosam* Wall., fere ut hybrida, referenda.

subsect. Eriosycea (Miq.) Corner ser. Eriosyceae Corner subser. Dehiscentes Corner

F. glandulifera (Wall. ex Miq.) King var. **camiguinensis** (Merr.) Corner comb. nov.—*F. banahaensis* Elmer, Leafl. Philip. Bot. 1 (1907) 252.—var. *typica* et var. *camiguinensis* (Merr.) Sata Monogr. (1944) 267, 370.—*F. camiguinensis* Merr. Philip. J. Sci. Bot. 9 (1914) 276.—This differs merely in details of hairiness.

var. **villosa** Corner v. nov.—Ut v. *glandulifera* sed costis et nervulis reticulatis subtus villosulis, pilis saepe undulosis, haud glabrescentibus. Borneo, Celebes, Morotai, New Guinea.

Borneo:—Bur. Sci. 193 (B.N.B.); For. Dept. B.N.B. 2930; Kostermans 6187 (pr. Sangkalang), 9546 (Mahakam River), East Borneo. Celebes:—NIFS bb 24166 (O. Masamba, Biridondok). Morotai:—Kostermans 1003, 1083. New Guinea:—BW 755 (Cyclops Mt.); Carr 12763 (Papua, Koitaki); Doctors v. Leeuwen 10537 (Nassau Mt.); Kanihera et Hatusima 13219 (Waren); NGF 3753 Sepik district, typus herb. Lae); NIFS bb 30745 (Biak), 31116 (Membramo, Hollandia).

subsect. Eriosycea (Miq.) Corner ser. Eriosyceae Corner subsect. Cuneifoliae Corner

F. chartacea Wall. ex King var. **lanceolata** Corner var. nov.—Lamina 7–23 × 1–3 cm., lanceolata: costis lateralibus utrinsecus 9–16, angulo lato exeuntibus, intercostis 0–1: petiolo 5–20 mm. Receptacula breviter stipitata. Frutex riparius, in silvis. Annam, Thailand.

Annam:—Poilane 10574, 12233, 18313, 19770, 32287 (det. *F. macilenta* King). Thailand:—Kerr 773 (Kaw Pa-ngan) 11724 (Nam Chut, Ranawng, *typus* herb. Br. Mus.); RFD 14834 (Nakhawn Srithamarat, Chawang).

F. litseifolia Corner sp. nov.—Frutex v. arbor –8 m. alta, trunco –20 cm. crasso, cortice rufobrunneo, latice albo: foliis brevipetiolatis spiraliter dispositis. Ramuli, petioli, stipulae, costae (subtus) et receptacula pilis albidis v. brunneis –0.5 mm. longis

appressis tenuiter vestiti, v. costae subtus pilis brevibus patentibus subscabrae. Ramuli 1.5–3 mm. crassi. Stipulae –7 mm. longae. Lamina 4–14 × 1.5–5 cm., lanceolata, anguste elliptica v. obovata, apice acuminata 7–18 mm. longo, basi cuneata v. basi cuneata v. subrotundata, integra v. distanter denticulata, raro sublobata, coriacea, laevis v. subtus subscabridula, sicco viridis v. subtus brunneola: costis lateralibus utrinsecus 4–8, angulo lato exeuntibus, intercostis 0–2 laxis, subtus leviter elevatis: costis basalibus utrinsecus 1, brevibus v. ad ½ laminae elongatis, glandulis basalibus nullis: petiolo 4–12 × 1 mm. Receptacula axillaria binata glabrescentia, maturitate rubra: pedunculo 2–7 mm. longo: bracteis basalibus 1 mm. longis: corpore receptaculi 5–8 mm. lato, ostiolo plano bracteis apicalibus parvis numerosis occluso: setis internis copiosis: cellulis sclereticis nullis. Tepala 4–5, rubra libera glabra v. apice ciliata. Flores masculi ordine uno sessiles ostiolares; staminibus 2. Flores feminei et cecidiophori sessiles v. pedicellis pilosis –2 mm. longis praediti: stylo femineo sparsim piloso. Semina 0.8–1 mm. longa, tuberculata, carinata. Cystolitha nulla, lamina pilis microscopicis cystolithiformibus praedita. Malaya, Sumatra, in silvis montanis 1,000–1,600 m. alt.

F. oreophilae Ridley affinis sed brevipilosa, receptaculis et seminibus minoribus, florum pedicellis pilosis, petiolis brevioribus differt.

Malaya:—Sing. F.n. 31094 (Trengganu, G. Padang). Sumatra:—Altson 14740 (Atjeh, Blangkedjeren); Bartlett 11128 (Tapianoeli, Toba); Forbes 2241 (Mt. Dempo); Jacobs 4672 et Meijer 3670, 5290 (Pajakumbah, Mt. Sago); v. Steenis 3548 (Palembang, G. Raja, *typus* herb. Leiden).

F. tuphapensis Drake var. **annamensis** (Gagnep.) Corner comb. nov. *F. annamensis* Gagnep. Lec. Notul. Syst. 4 (1927) 85.—*F. cambodica* Gagnep. id. 87.—This differs from v. ***tuphapensis*** in the larger fig, the two stamens rather than one in the male flower, and the puberulous female style. It relates *F. tuphapensis* closely with *F. chartacea.*

subsect. Eriosycea (Miq.) Corner ser. Auratae Corner subser. Auratae

F. endospermifolia Corner sp. nov.—Arbor –25 m. alta, foliis longipetiolatis spiraliter dispositis, omnibus partibus pilis brunneis rigidis patentibus 0.5–1.5 mm. longis hispido-villosis, nervulis subtus villosulis v. minute puberulis. Ramuli 4–7 mm. crassi, lente glabrescentes. Stipulae 10–30 mm. longae, appresse

pilosae. Lamina 13–25 cm. lata, tam longa quam lata v. paulum latior, ovata, apice acuminata –12 mm. longo, basi cordata v. subtruncata, denticulata, membranacea, supra hispidula, subtus villosa, sicco brunnea: costis lateralibus utrinsecus 4–5, glandulis axillaribus praeditis, intercostis strictis –16, subtus elevatis, areolis glabris: costis basalibus utrinsecus 3–4, ad ½–2/3 laminae elongatis, glandulis basalibus 2: petiolo 35–100 mm. longo, glandula subnodali praedito. Receptacula axillaria binata sessilia, hispido-villosa v. tomentosa, 18–25 × 15–20 mm. (23–30 mm. longa et lata, viva), ovoidea v. subglobosa, ostiolo parvo subdepresso: bracteis basalibus 3–5 mm. longis, ovatis, obtusis v. breviter acuminatis, appresse pilosis, caducis: setis internis –2.5 mm. longis, flavidis, copiosis: cellulis scleroticis in pariete receptaculi cecidiophori copiosis, feminei sparsis v. nullis. Florum pedicelli pilosi. Flores masculi 2.5–7 mm. alti, ordinibus numerosis ostiolares, sessiles v. pedicellis –4 mm. longis praediti: tepalis 4, rubris, margine ciliolatis, haud setosis: staminibus 2, antheris breviter mucronatis. Flores neutri (in rec. fem.) ordinibus 2–3 ostiolares. Flores feminei et cecidiophori sessiles v. pedicellis –4 mm. longis praediti: tepalis 3–4, lanceolatis v. anguste spathulatis, flavidis, apicem versus dense setosis: stylo femineo piloso. Semina 1–1.3 mm. longa, breviter oblonga, carinata, tuberculata. Cysotolitha nulla. Borneo (Mt. Kinabalu), in silvis montanis 1,000–1,800 m. alt.

Clemens 28223 (Tenompok), 34381 (Colombon River): For. Dept. B.N.B. 3621, A4492 (Tenompok, *typus* herb. Kew); San. 15444 et Sinclair 8974 (Kota Belud, Kandasan); Sing. F.n. 26902, 27842 (Tenompok).

F. bruneiensis, F. eumorpha, et haec species arbores spectabiles latifoliatae hispidissimae ad regionem North Borneo restrictae. *F. auratae* affinis sed *F. bruneiensis* et *F. endospermifolia* inter alia praecipue florum masculorum tepalis rubris, non setosis, ut in ser. *Eriosyceae* distinctae.

F. bruneiensis Corner sp. nov.—Arbor –13 m. alta, cortice brunneo, latice albo copioso, foliis longipetiolatis spiraliter dispositis: stipulis, petiolis costisque primo rubris (vivis). Petioli et costae (subtus) pilis aureis v. brunneis rigidis patentibus 2–4 mm. longis strigosi, nervuli pilis brevioribus: nervuli reticulati et areolae subtus toto minute velutinati. Ramuli 6–9 (–12) mm. crassi, minute puberuli mox glabri, brunnei, cavi. Stipulae 20–60 mm. longae, lanceolato-ellipticae caducae, appresse sericeo-puberuli, pilis brunneis longis paucis ad carinam praeditis. Lamina 28–45 × 16–28 cm., elliptica v. ovata, apice acuminata –15 mm.

longo, basi cordata v. rotundato-cuneata, denticulata, membranacae, scabrida, sicco viride-brunnea: costis lateralibus utrinsecus 5–6, glandulis axillaribus praeditis, intercostis strictis –12, subtus elevatis, areolis ut nervulis reticulatis minute velutinosis: costis basalibus utrinsecus 3–4, ad ½ laminae elongatis, glandulis basalibus 2: petiolo 80–180 m. longo, glandula subnodali praedito. Receptacula axillaria binata sessilia, pilis pallidis 1–2 mm. longis dense hispido-villosa, maturitate rubra, 24–30 × 20–26 mm. (pilis exclusis: –30 mm. lata, viva), subglobosa v. ovoideo-conica, ostiolo bracteis apicalibus 3–5 occluso: bracteis basalibus 6–10 × 5–7 mm., ovatis v. oblongo-ellipticis, acutis, minute appresse puberulis, caducis: setis internis –2.5 mm. longis, copiosis, flavidis: cellulis scleroticis sparsis in pariete receptaculi cecidiophori. Flores masculi et cecidiophori ut in *F. endospermifolia*, sed majusculi: aliquando staminibus 3. Cystolitha nulla. Brunei (Ulu Belalong, prope flumen; Brunei 5338, typus herb. Cambridge).

Inter *F. endospermifoliam* et *F. brunneo-auratam*, sed ramulis subglabris, receptaculis majoribus. Forsan arbor montana secundo flumine descendens.

F. brunneo-aurata Corner sp. nov.—Arbor –15 m. alta, foliis longipetiolatis spiraliter dispositis, juvenilibus 3–5 palmato-lobatis. Indumentum duplex: ramuli et petioli pilis aureis v. fusco-brunneis 1–4 mm. longis patentibus strigosi, costae subtus brevioribus, et omnes partes (praeter paginam laminae superiorem) pilis brevibus pallidis minute velutinosi. Ramuli 3–6 (–10) mm. crassi. Stipulae 10–35 mm. longae (ad folia juvenilia –70 × 18 mm.) sericeae, pilis longis brunneis paucis ad carinam praeditae. Lamina 15–30 × 6–14 cm., (–50 × 45 cm., juvenilia lobata), ovato-elliptica v. elliptica, apice acuminata –10 mm. longo, basi anguste subcordata v. cuneata, serrulata v. subintegra, chartaceo-coriacae, sicco brunnea: costis lateralibus utrinsecus (3–) 4–5 (–8), glandulis axillaribus praeditis, intercostis numerosis strictis, subtus elevatis, areolis ut nervis et nervulis minute velutinosis: costis basalibus utrinsecus 2–3, ad 1/3–2/3 laminae elongatis, glandulis basalibus 2: petiolo 15–60 mm. longo, glandula subnodali praedito. Receptacula axillaria binata sessilia velutinata glabrescentia, maturitate rubra, 11–16 mm. lata (12–22 mm., viva) subglobosa, subsulcata, ostiolo bracteis apicalibus 3 planis occluso: bracteis basalibus 1–1.5 mm. longis, pusillis ovatis acutis: setis internis 1.5–3 mm. longis brunneolis copiosis: cellulis scleroticis numerosis. Flore masculi ordinibus

numerosis ostiolares, sessiles v. pedicellis subrubris sparsim pilosis praediti: tepalis 4 rubris spathulatis, marginibus ciliolatis: staminibus 2. Flores neutri (in rec. fem.) ostiolares, tepalis rubris. Flores feminei et cecidiophori sessiles v. pedicellis glabris v. sparsim pilosis, aliquando cecidiophoris induratis, praediti: tepalis 3–4, dense setosis ut in *F. aurata,* albidis: stylo femineo rubro, puberulo v. glabro. Semina ut in *F. aurata.* Cystolitha nulla. Borneo, in silvis secundariis ad 1,100 m. alt., forsan communis.

F. hirta et *F. fulva* confusa et praecipue *F. subfulva.* Plantas numerosas vivas in Sarawak et Brunei studui, semper distinctas.

Sarawak: —Beccari 1360 (det. *F. hirta* v. *roxburghii*); Corner s.n. Jan. 1959; Haviland 153; Brunei:—Brunei 5307, 5308. Brit. North Borneo, Kinabalu: —Sing. F.n. 25125 (Dallas), 26608 (Menetendok Gorge, *typus* herb. Singapore). Indonesian Borneo: — Hallier 1519 et 2525 (G. Klam), 2909 (Lianggagang), det. *F. fulva.*

F. aurata Miq. var. **brevipilosa** Corner v. nov.—*F. inaequipetiolata* Merr. Philip. J. Sci. 21 (1922) 517.—Ramuli, petioli, et receptacula pilis brevioribus 0.5–1 mm. longis sparsim hirsuti, nervuli subglabri. Lamina 12–26 × 2.5–8.5 cm., oblonga, lanceolata, v. subovata, utrimque scabriuscula: costis lateralibus utrinsecus 4–9, v. 16–20 in laminis oblongis v. lanceolatis. British North Borneo.

Bur. Sci. 178, 485, 602 (typus), 1141, 1885; Creagh s.n. (1895), For. Dept. B.N.B. 2459, 9368, 9371; Ridley s.n. (1887).

var. **longipilosa** Corner v. nov.—Ramuli, petioli, et costae (subtus) pilis 2–4 mm. longis villosi (1–2 mm. in v. *aurata*). Lamina elliptico-obovata v. oblonga. Malaya, Sumatra, Riouw Archipelago, Borneo.

Malaya (Singapore to Perak): —For. Dept. 12110, 15076; Hullett 381; Hume 9203; King's coll. 8553; Sing. F.n. 29387, 32313 (*typus*, herb. Singapore). Sumatra: —Bartlett 7885 (Asahan); Curtis 3548 (Indragiri); Postumus 563, 674, 685 (Djambi). Riouw: —Bunnemeyer 6952 (Lingga); Buwalda 6229 (Riouw). Borneo: —Brunei 575; Hallier 2238 (G. Klam); Motley 600 (Banjermasim); Teysmann 7899 (det. *F. hirta*).

var. **palawanensis** Corner v. nov.—Quisumbing, Philip. J. Sci. 41 (1930) 317 (ut *F. chrysocarpa*).—Folia sicca fusco-brunnea (aureo-brunnea in v. *aurata*): juvenilia breviter trilobata, basi cordato-subtruncata, petiolo –16 cm. longo: lamina superiora 15–28 × 8–17 cm., elliptica v. obovata, basi cordata v. late cuneata; costis lateralibus utrinsecus 4–6. Pili ut in v. *aurata:* nervuli subtus

villosuli, areolae glabrae. Receptacula 14–18 × 12–14 mm. Palawan, Balabac. Bur. Sci. 49913, 77382 (*typus*, herb. Singapore), 77425.

Forsan species nova, *F. brunneo-auratae* affinis. Folia juvenilia palmato-lobata in *F. aurata* incognita.

var. **pedunculata** Corner v. nov.—Ut v. *aurata* sed receptacula pedunculis 2–5 mm. longis, cellulis scleroticis in pariete praedita. Malaya.

Perak:—King's coll. 3738, 4328, 5834, 7776, 10106, 10225 (det. *F. hirta* et *F. chrysocarpa*); Scortechini 365 (*typus*, herb. Singapore), 529; Wray 493. Trengganu:—Kep. F.n. 26990 (S. Kemaman); Selangor:—H. M. Burkill 1021 (S. Buloh), For. Dept. 12900 (Ginting Simpak). Java:—HHBB 135866, 135867, 135868 (cult.).

subsect. Eriosycea (Miq.) Corner ser. Auratae Corner subser. Monandreae Corner

F. androchaete Corner sp. nov.—Arbor –10 m. alta, foliis spiraliter dispositis. Ramuli, stipulae, petioli, et receptacula pilis rigidis appressis flavidulis 0.5–1 mm. longis tenuiter vestiti, glabrescentes: costae subtus pilis patentibus sparsis, nervuli subglabri. Ramuli 3–4 mm. crassi. Stipulae –7 mm. longae. Lamina 11–20 × 4–9 cm., elliptica v. subobovata, saepe angusta, apice acuminata –10 mm. longo, basi cuneata, integra, subcoriacea, utrimque subscabrida, sicco brunnea: costis lateralibus utrinsecus 4–6, obliquis, intercostis –4, subtus leviter elevatis: costis basalibus utrinsecus 1, ad 1/3–½ laminae elongatis, glandulis basalibus 2: petiolo 12–50 mm. longo: lamina juvenilia –33 × 13 cm., oblongo-elliptica, apice –35 mm. longo acuminata, haud lobata, costis lateralibus utrinsecus 5–8, petiolo –110 mm. longo. Receptacula axillaria binata: pedunculo 3–5 × 2 mm.: bracteis basalibus 1–1.5 × 2–3 mm., ovatis, subacutis: corpore receptaculi 12–15 mm. lato, subgloboso, ostiolo parvo plano: setis internis –1.5 mm. longis, copiosis: cellulis scleroticis nullis. Florum pedicelli setosi. Flores masculi ordinibus duobus ostiolares, secundo pedicellati: tepalis 3, setosis, albidis: stamine uno. Flores feminei et cecidiophori sessiles v. pedicellis –5 mm. longis praediti: tepalis 3–4, setosis, albidis: stylo glabro. Semina 1.3 mm. longa, carinata, tuberculata. Cystolitha nulla. North Borneo, in silvis prope flumina.

F. macilentae affinis, sed omnibus partibus major.

Brunei 389, 5309, 5310, 5320 (Ulu Belalong, *typus* herb. Cambridge); For. Dept. B.N.B. San. 16285, 17397; Nieuwenhuis (Taheri) 952 (Tepoese, Lilit boelan).

F. macilenta King var. **gibbsiae** (Ridley) Corner comb. nov.—*F. gibbsiae* Ridley, J. Linn. Soc. Bot. 42 (1915) 137.—This differs from v. *macilenta* in the pedunculate fig, and the less hairy leaves and fig.

var. **ilicifolia** Corner v. nov.—Ramuli, petioli, stipulae, costae (subtus), et receptacula sparsim et minute puberuli, glabrescentes. Lamina 2.5–11 × 1–4 cm., lanceolato-elliptica, apice acuminata –10 mm. longo, basi cuneata, grosse et distanter dentata dein integra, coriacea, utrimque scabriuscula, sicco flavo-viridis et subtus aureo-brunnea: costis lateralibus utrinsecus 4–8, intercostis 0–1, nervulis reticulatis subtus leviter elevatis: costis basalibus brevibus: petiolo 8–40 mm. Receptacula solitaria, 7–11 mm. lata: pedunculo 3–10 mm. longo: cellulis scleroticis copiosis. Kinabalu, 1500–2000 m. alt. Clemens 50712, Gurulau spur; Sing. F. n. 26952, path to Ranau, *typus* herb. Singapore.

A var. *gibbsiae* pedunculo longiori, lamina subscabrida, saepe dentata differt.

F. eumorpha Corner sp. nov.—Arbor –18 m. alta, Ramuli, folia, et receptacula pilis fusco-brunneis patentibus 0.5–1.5 mm. longis dense hispidi, nervuli subtus et areolae pilis albidis v. fulvidulis –0.5 mm. longis minute velutinosi. Ramuli 4–5 mm. crassi. Stipulae –15 mm. longae, strigoso-hispidae. Lamina 8–20 × 6.5–14 cm., ovato-cordata v. subtriangularis, longior quam lata, breviter acuminata, dentata, membranacea, supra hispido-pustulata, sicco griseo et subtus aureo-brunnea: costis lateralibus utrinsecus 5–7 (–8), intercostis –6, subtus elevatis, areolis impressis velutinosis: costis basalibus utrinsecus 3, ad 1/3–½ laminae elongatis, glandulis basalibus 2: petiolo 40–85 mm. longo. Receptacula axillaria binata sessilia, aureo-hispida, 16–17 × 14–15 mm. (pilis exclusis; 18–20 mm., viva), subglobosa v. ellipsoidea, ostiolo bracteis apicalibus 3–4 subumbonatis occluso: bracteis basalibus 3–3.5 mm. longis, ovato-acutis, appresse pilosis: setis internis 1–2 mm. longis, copiosis. cellulis scleroticis sparsis. Flores masculi et cecidiophori ? Flores neutri ordine uno ostiolares sessiles. Flores feminei sessiles v. pedicellis albido-setosis –2.5 mm. longis praediti: tepalis 3, albidis, dense setosis: stylo puberulo v. glabro. stigmate bifido. Semina 1–1.2 mm. longa, subcarinata, subtuberculata (? immatura). Cystolitha nulla. Borneo.

var. **eumorpha.**—Sing. F. n. 27566, Tibobah River (*typus* herb. Singapore); Clemens 32524, Marai Parai "perhaps the tallest Ficus in this vicinity".

var. **subglabra** Corner v. nov.—Areolae subtus puberula v. subglabra. Florum femineorum tepala glabra v. ad apicem pilis 1–3 praedita. Receptacula, minora, 8–9 × 10–11 mm., bracteis basalibus obtusis, cellulis scleroticis copiosis. Central East Borneo (W. Koetai, Mt. Kemoel, 1,800 m. alt.; Endert 4416, *typus* herb. Leiden.).

Inter *F. endospermifoliam* et *F. paramorpham* sed. floribus masculis incognitis, incertae sedis.

F. paramorpha Corner sp. nov.—Frutex v. arbor parva. Ramuli, petioli, et costae (subtus) pilis fusco-brunneis patentibus –0.5 mm. longis villosi, nervuli subtus pilis brevioribus, aliquando ramuli et petioli appresse pilosi. Ramuli 2–3 mm. crassi. Stipulae –7 mm. longae, appresse brunneo-pilosae. Lamina 6–14 × 3–5.5 cm, elliptica, breviter acuminata, basi cuneata, serrato-denticulata, plus minus chartacea, supra hispido-scabra, sicco grisea et subtus aureo-brunnea: costis lateralibus utrinsecus 5–6, intercostis –5, subtus valde elevatis, areolis quasi glabris: costis basalibus utrinsecus 1 (–2), ad ¼–1/3 laminae elongatis, glandulis basalibus 2: petiolo 12–25 mm. Receptacula axillaria binata sessilia, pilis fusco-brunneis brevibus appressis tenuiter vestita, maturitate rubra, 9–10 mm. lata, subglobosa: bracteis basalibus 1.5 mm. longis, ovato-subacutis: setis internis –2.5 mm. longis, copiosis, aureis: cellulis scleroticis copiosis. Florum pedicelli setosi: tepala 3–4 albido-setosa. Flores masculi ordine uno ostiolares: stamine uno. Flores feminei et cecidiophori sessiles v. pedicellati: stylo glabro. Semina 1–1.2 mm. longa, subcarinata, subtuberculata (? immatura). Cystolitha nulla. Borneo Kinabalu, 1,600–2,200 m. alt.).

Clemens 31777, Upper Kinataki River, *typus* herb. Leiden; 32523, Marai Parai.

F. eumorphae affinis sed lamina elliptica, receptaculis minoribus inter alia differt.

F. setiflora Stapf var. **adelpha** Corner v. nov.—Ramuli, petioli, costae (subtus), et receptacula pilis albidis v. aureo-brunneis obliquis 0.5–1 mm. longis villosi. Ramuli 2–2.5 mm. crassi. Lamina 4.5–12 × 2–4.5 cm., anguste elliptica v. lanceolata, breviter acuminata, basi anguste cuneata, supra hispidulo-scabra, subtus villosa: petiolo 3–18 mm. Receptacula 6–7 mm. lata, pedunculo 1–2.5 mm. longo. Stylus femineus pilosus. Semina obtuse carinata, valde tuberculata. North Borneo Kinabalu, 1,100–2,500 m. alt.).

Ut speciminibus exsiccatis videtur, decidua. A var. *setiflora* indumento villoso, lamina anguste elliptica, pedunculo distincto differt.

Sing. F.n. 26930, 27876 (Tenompok, *typus* herb. Singapore); Sinclair 8975 (Bt. Kinasaruban); Clemens (Tenompok, Colombon River, et Mt. Nunok) 28402, 28433, 29353, 29482, 30295, 32684, 32719, 33905, 34453, 40123.

var. **puberula** Corner v. nov.—Ramuli et petioli pilis –0.5 mm. longis subvillosuli, costae subtus sparsim puberulae. Receptacula sparsim appresse puberula, pedunculo 0.5–1 mm. longo. Stylus femineus glaber. Semina obtuse carinata, valde tuberculata. Central East Borneo (W. Koetai, Mt. Kemoel, 1,700 m. alt.; Endert 4275, *typus* herb. Leiden).

Forsan v. *adelphae* forma.

Taxonomic Notes on Ficus Linn., Asia and Australasia

IV. SUBGEN. FICUS SECT. SYCIDIUM MIQ.

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Summary

New sections, subsections, and series:—subsect. ***Sycidium*** ser. *Prostratae, Pungentes, Phaeopilosae,* and *Copiosae* ser. nov.; subsect. *Varinga* (Miq.) Corner comb. nov., ser. *Heterophylleae, Cyrtophylleae,* and *Exasperatae* ser. nov.; subsect. ***Palaeomorphe*** (King) Corner comb. nov., ser. *Subulatae* and *Fibrosifoliae* ser. nov.

Earlier specific epithets:—*F. semicordata* B. Ham. ex J.E. Sm. (*F. cunia* B. Ham. ex Roxb.), *F. pungens* Reinw. ex Bl. (*F. myriocarpa* Miq.), *F. wassa* Roxb. (*F. duriuscula* King), *F. fraseri* Miq. (*F. proteus* Bur.), *F. coronata* Spin. (*F. stephanocarpa* Warb.), *F. asperiuscula* Kunth et Bouché (*F. leptorhyncha* Koord. et Val.), *F. virgata* Reinw. ex Bl. (*F. decaisneana* Miq.), *F. heteropleura* Bl. (*F. urophylla* Wall. ex Miq.), *F. sinuata* Thunb. (*F. rostrata* Lam.).

New names for later homonyms:—*F. gul* Laut. et K. Schum. (*F. rudis* Miq., non Pers.), *F. andamanica* Corner (*F. macropoda* Kurz, non Miq.), *F. elmeri* Merr. (*F. semicordata* Miq., non J.E. Sm.), *F. celebensis* Corner (*F. irregularis* Miq., non Steud.).

New species:—*F. koutumensis, F. complexa, F. porphyrochaete, F. subsidens, F. griseifolia, F. primaria, F. cauta, F. goniophylla, F. tenuicuspidata* et v. *major, F. oleracea* et v. *pugnans, F. chrysochaete, F. imbricata, F. gryllus, F. erinobotrya* et v. *solomonensis* et f. *glabrior, F. leptogramma, F. praetermissa, F. midotis, F. leptocalama, F. rubrocuspidata, F. rubromidotis.*

New subspecies and varieties:—*F. gul* Laut. et K. Schum. v. *lasiocarpa* Corner, v. *solomonensis* Corner; *F. montana* Burm. f. v. *purpurascens* (Bl.) Corner; *F. madurensis* Miq. v. *angustifolia* Corner; *F. copiosa* Steud. v. *pubescens* Corner; *F. wassa* Roxb. v. *nubigena* (Diels) Corner, v. *obversifolia* (Miq.) Corner; *F. balica* Miq. v. *colffsii* Corner; *F. cumingii* Miq. v. *androbrota* (Summerh.) Corner v. *angustissima* (Merr.) Corner, v. *worcesteri* (Merr.) Corner; *F. fiskei* Elmer v. *multinervia* Corner; *F. riedelii*

Miq. v. *minor* Corner; *F. ampelas* Burm. f. v. *linearis* Corner, v. *soronensis* (King) Corner; *F. guyeri* Elmer v. *sibuyanensis* (Elmer) Corner; *F. melinocarpa* Bl. v. *hololampra* (Diels) Corner; *F. trachypison* Laut. et K. Schum. v. *pallida* Corner; *F. tonsa* Miq. v. *aspera* Corner, *v. leptodictya* (Diels) Corner, v. *subcordata* Corner; *F. irisana* Elmer v. *validicaudata* (Merr.) Corner; *F. opposita* Miq. v. *micracantha* (Miq.) Corner, v. *indecora* (A. Cunn. ex Miq.) Corner; *F. storckii* Seem. v. *kajewskii* (Summerh,) Corner; *F. tinctoria* Forst. f. ssp. *gibbosa* (Bl.) Corner et v. *rigida* Miq., ssp. *parasitica* (Willd.) Corner et v. *anastomosans* (Wall. ex Kurz) Corner, ssp. *swinhoei* (King) Corner; *F. virgata* Reinw. ex Bl. v. *philippinensis* (Miq.) Corner, v. *sessilis* (Bur.) Corner; *F. subulata* Bl. v. *gracillima* (Diels) Corner; *F. sinuata* Thunb. v. *oblonga* Corner, ssp. *cuspidata* (Reinw. ex Bl.) Corner; *F. heteropleura* Bl. v. *hirta* Corner, v. *mindanaensis* (Warb.) Corner; *F. aurita* Reinw. ex Bl. v. *auriculifera* (Merr.) Corner, v. *celebica* (Reinw. ex Bl.) Corner; *F. obscura* Bl. v. *angustata* (Miq.) Corner, v. *borneensis* (Miq.) Corner, v. *kunstleri* (King) Corner.

Notes on *F. madurensis* Miq., *F. ampelas* Burm. f., *F. scobina* Benth., *F. aspera* Forst. f., *F. cyrtophylla* Wall. ex Miq., *F. obscura* Bl.

sect. Sycidium Miq.

Hook. Lond. J. Bot. 7 (1848) 228; Ann. Mus. Bot. Lugd. Bat. 3 (1867) 291; King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 73; OK in T. Post Lex. Gen. Phan. (1904) 236; Sata, Monogr. (1944) 252.—subgen. *Sycidium* (Miq.) Mildbr. et Burr. Engl. Bot. Jahrb. 46 (1912) 175.—Dioecious. Figs pedunculate or pedicellate without a collar of basal bracts, rarely sessile: body often with scattered lateral bracts. Tepals free or shortly joined, red, pink, or white. Male flowers ostiolar: stamen 1, or 1–2: anther not mucronate. Style subterminal: stigma simple, subclavate. Seed small, lenticular or shortly oblong, generally with a single keel, smooth or, in a few species, reticulate: hilum rarely prominent. Cystoliths variously present. Africa, Asia, Australasia, c.100 spp. Lectotypus:—*F. aspera* Forst. f.

In 1848 Miquel made three series of this section. King (1887) extrated ten species along with numerous synonyms, and made of them sect. *Palaeomorphe* King. These comprise most of the two series Cuspidate and Pallidae, which I refer accordingly to subsect. Palaeomorphe. The species of the third series *Scabrae* Miq. were mostly retain by King in sect. Sycidium, the typification of which should, therefore, come from this series. Choice of type might favour *F. montana* Burm f., which appears with six other species.

now known to be synonyms, in ser. *Scabrae*, but *F. montana* has generally a gall-ovary in the male flower and should have been placed by King in sect. *Palaeomorphe*. Second choice might be *F. scabra* Forst. f., but Miquel does not appear to have seen a specimen of it in 1848. Hence I choose the related *F. aspera* Forst. f. which makes the largest group of species representative of the section and subsect. *Sycidium*.

subsect. **Sycidium.**—sect. *Covellia* (Gasp.) Miq. subsect. *Pandaniflorae* Sata, Monogr. (1944) 293 (ut Pandanusiiflorae; lectotypus, *F. minahassae* Teysm. et de Vr.).—subsect. *Pseudosycidium* Sata, id. 253, 258, 381 (lectotypus, *F. fiskei* Elmer).—Seed lenticular, as long as wide, slightly keeled all round or in the upper half, rarely not at all. Male flowers without a normal gall-ovary, sometimes with a rudiment. Fig often pedunculate with a collar of three basal bracts. Cystoliths often papillate. Trees or shrubs, not epiphytic or climbing. Trop. Asia, Australasia, 65 spp. Lectotype, *F. aspera* Forst. f.

ser. **Prostratae** Corner ser. nov.—Albido- v. brunneo-pilosae. Folia brevipetiolata disticha. Receptacula geocarpica ad ramos efoliatos internodis elongatis e trunco basim versus orientes, bracteis basalibus ternatis pedunculata, corpore saepe bracteis lateralibus paucis, setis internis praedito, cellulis scleroticis nullis. Tepala rubra glabra. Stamine 1–2. Ovarium rubrum v. albidum, stylo glabro. Semina 1–1.5 mm. longa, hilo non prominenti. Cystolitha plerumque hypogena. Continens Asiatica, 3 spp. Typus, *F. semicordata* B. Ham. ex J. E. Sm. (*F. cunia* B. Ham.).

This series relates with sect. *Ficus*, but habit and convenience place it here. *F. semicordata* has two stamens in the male flower. *F. prostrata* has one, while in *F. koutumensis* the male flowers are not known. The first two species have usually been placed in sect. *Sycocarpus* (*Covellia*) because of their cauliflorous habit, but the free tepals at once exclude them, and relate them with the following two series.

ser. **Pungentes** Corner ser. nov.—*Bosscheria* Teysm. et de Vr. Nat Tijd. N.I. 23 (1861) 212.—sect. *Covellia* (Gasp.) Miq. subsect. *Pandaniflorae* Sata, Monogr. (1944) 293 (ut Pandanusiiflorae; lectotypus, *F. minahassae* Teysm. et de Vr.).—Brunneo-setosa. Folia longipetiolata spiraliter disposita, aut brevipetiolata et disticha. Receptacula parva pedunculata, bracteis basalibus ternatis, lateralibus deficientibus, rami- et cauliflora ad ramos longos efoliatos pendentes sed haud geocarpicos: setis internis copiosis longis albidis: cellulis scleroticis nullis. Tepala 3–4 rubra glabra.

Ovarium brunneo-rufum, femineum stylo hirsutissimo. Semina 0.5–0.7 mm. longa, hilo parvo prominenti. Cystolitha hypogena. Borneo, Philippines, Malaysia Orientalis, 3 spp. Typus, *F. pungens* Reinw. ex Bl.

As the preceding series, this has also been wrongly assigned to sect. *Sycocarpus*. *F. minahassae* and *F. pungens* are closely allied, but the third, *F. petrotica* Diels, has distichous, short-petiolate, leaves.

ser. **Phaeopilosae** Corner ser. nov.—Purpureo- v. brunneo-setosae v. hirtae. Folia longipetiolata symmetrica spiraliter disposita. Receptacula axillaria v. cauliflora, raro geocarpica, sessilia v. pedicellata, bracteis lateralibus dispersis, ad corpus receptaculi saepe bene evolutis: cellulis scleroticis nullis. Tepala rubra glabra. Ovarium albidum, stylo glabro. Borneo, Philippines, Malaysia Orientalis, 7 spp. Typus, *F. complexa* Corner.

This is the most generalised series and it relates to the more generalised species of sect. *Adenospermal* and sect. *Sycocarpus*. Except for *F. gul* Laut. et K. Schum., the species occur in New Guinea.

ser. **Copiosae** Corner ser. nov.—Albido-pilosae v. glabrae, saepe scabridae. Folia plerumque longipetiolata et symmetrica, spiraliter disposita v. decussata. Receptacula axillaria v. rami- et cauliflora, pedicellata bracteis lateralibus paucis parvis dispersis: cellulis scleroticis nullis v. paucis. Tepala purpureo-rubra pallescentia v. albida, saepe puberula v. hispidula. Ovarium albidum. India usque ad insulas Solomon. 11 spp. Typus, *F. copiosa* Steud.

ser. **Scabrae** Miq. Hook. Lond. J. Bot. 7 (1848) 228.—subgen *Palaeomorphe* (King) Sata sect. *Palaeomorphe* ser. *Nonminutuliflorae* Sata (lectotype, *F. ulmifolia* Lam.), subser. Fulvobrunneifoliae Sata (lectotypus, *F. ulmifolia* Lam.) et subser. Metallicifoliae Sata (lectotypus, *F. blepharistoma* Warb.), Monogr. (1944) 223, 224, 378.—subgen. *Eumetamorphe* Sata sect *Sycidium* Miq. subsect. *Sycidium* ser. *Viridifoliae* Sata (lectotypus, *F. worcesteri* Merr.) et ser. *Lineariangustifoliae* Sata (lectotypus, *F. angustissima* Merr.), Monogr. (1944) 253, 254, 380.—subsect. *Pseudosycidium* Sata (lectotype, *F. fiskei* Elmer et ser. *Scabricordatogibbosiifoliae* Sata (lectotype, *F. fiskei* Elmer), ser. *Lanceifolicae* Sata (lectotype, *F. celtoides* Elmer), ser. *Subscabririgidiifoliae* Sata (lectotype, *F. ampelas* Burm. f.), Monogr. (1944) 253, 258, 260, 262, 381, 382.—Albido-, luteo- v. brunneo-pilosae. Folia brevipetiolata decussata, spiraliter disposita, v. disticha, saepe asymmetrica et scabra. Receptacula axillaria v. cauliflora, pedunculata

v. pedicellata: cellulis scleroticis nullis v. copiosis. Ovarium albidum: stylo puberulo v. glabro. Seminis hilum non prominens. Madagascar, Ryu Kyu, Formosa, Malay Archipelago, Australasia, c. 50 spp. Lectotypus, *F. aspera* Forst. f.

This is the short petiolate remainder, comprising the majority of the species. Let us hope that some of these synonyms may never have to be used.

subsect. **Varinga** (Miq.) Corner comb. nov.—*Ficus* sect. *Carica* Miq. subsect. *Varinga* Miq. Ann. Sci. Nat. ser. 3, 1 (1844) 33 (haud sect. *Varinga* Miq. sensu OK in T. Post Lex. Gen. Phan. 1904, 236).—Ut subsect. *Sycidium* sed semina breviter oblonga: tepala et ovarium albida. Arbores v. frutices, raro sarmentosae (Africa), haud epiphytica. Africa, Ceylon, Asia continentalis, Sumatra, Java, Borneo, c. 13 spp. Lectotypus, *F. scabrella* Roxb. (*F. heterophylla* Linn. f.).

As the character of subsect. *Varinga*, Miquel gave the unistaminate flower. This excludes all the species which he cited except *F. scabrella* Roxb., which is a synonym of *F. heterophylla* Linn. f., and *F. radicans* Roxb. which, as a synonym of *F. heteropleura* Bl., is provided for in subsect. *Palaeomorphe* (King) Corner. Hence my choice of *F. scabrella* as lectotype. The species much resemble those of ser. *Scabrae* (subsect. *Sycidium*) but cannot be fitted in with them, and the group permeates a different geographical region.

ser. **Heterophylleae** Corner ser. nov.—Receptacula axillaria solitaria, 10–20 mm. lata v. latiora, plerumque pedunculata bracteis basalibus ternatis, lateralibus et setis internis deficientibus. Tepala plus minus glabra. Semina laevia. Lamina plus minus symmetrica. Africa, Asia, 6 spp. Typus, *F. heterophylla* Linn. f.

ser. **Cyrtophylleae** Corner ser. nov.—Receptacula binata, axillaria v. ad truncum ramosque fasciculata, pedicellata, bracteis lateralibus dispersis. Tepala plus minus glabra. Semina laevia. Folia disticha brevipetiolata, saepe asymmetrica. Africa, Asia, 6 spp. Typus, *F. cyrtophylla* Wall. ex Miq.

ser. **Exasperatae** Corner ser. nov.—Receptacula axillaria, plerumque solitaria, pedicellata, bracteis lateralibus dispersis. Tepala hispida. Semina reticulata. Africa usque ad Indiam, Ceylon, 1 sp. *F. exasperata* Vahl.

subsect. **Palaeomorphe** (King) Corner comb. nov.—*Ficus* sect. *Paleomorphe* King, Ann. R. Bot. Gard. Calc. 1 (1887) 1, 3.—subgen. *Palaeomorphe* (King) Sata, J. Soc. Tr. Agr. 6 (1934)

26; Monogr. (1944) 217.—Ficus sect. *Grossularia* OK in T. Post Lex. Gen. Phan. (1904) 236.—Semina oblonga, apice carinata v. gibbosa, laevia. Flores masculi plerumque ovario cecidiophori praediti. Folia disticha brevipetiolata. Receptacula pedicellata v. sessilia, bracteis haud in collare ternatis. Cystolitha haud papillata. Arbores, frutices, saepe epiphytica etiam suffocantes, v. sarmentosae: ramulorum radicumque cortice saepe flavescenti. Asia, Australasia, 19 spp. Lectotypus, *F. gibbosa* Bl. = *F. tinctoria* Forst. f. ssp. *gibbosa* (Bl.) Corner.

The tendancy is to discard this group because of the variable development of the gall-ovary in the male flower in the whole section. When, however, the shape of the seed, the leaf-arrangement, and the habit of the plants are taken into account, the well-developed, insect-inhabited, gall-ovary in these species is, as King perceived, a good character. Thus the group is certainly distinguishable as a natural entity from subsect. *Sycidium,* and should, perhaps, be given its original sectional rank. However, I prefer to await the elucidation of the African and Madagascan species and their relation with ser. *Copiosae* (subsect. *Sycidium*), for they impinge on the species of subsect. *Palaeomorphe.*

ser. **Pallidae** Miq. Hook. Lond. J. Bot. 7 (1848) 433.—ser. *Euglabrifoliae* Sata (lectotypus, *F. tinctoria* Forst. f.) Monogr. (1944) 217, 218, 377.—ser. *Glabrifoliae* Sata (lectotypus, *F. philippinensis* Miq.), id. 262, 382.—Arbores mediocres v. grandes, saepe epiphyticae et suffocantes. Stipula terminalis plerumque conspicua, recta, rigida. Lamina coriacea, haud caudata, plerumque integra, sicco pallida v. subtus brunneo-areolata. Receptacula sicca laevia, bracteis lateralibus nullis: setis internis minutis.: cellulis scleroticis in pariete copiosis. Tepala puberula v. hispidula. Cystolitha amphigena. Asia, Australasia, 3 spp. Lectotypus, *F. tinctoria* Forst. f.

Of the species assigned first to this series by Miquel, *F. hederacea* Roxb. belongs to sect. *Rhizocladus* Endl., *F. septica* Burm f. to sect. *Sycocarpus* Miq., and *F. undulata* B. Ham. (*F. nervosa* Heyne) to subgen. *Pharmacosycea* Miq. These excluded, the remaining eleven are *F. tinctoria* and *F. virgata* Reinw. ex Bl. or their synonyms. I choose *F. tinctoria* as type because it is the better known.

ser. **Subulatae** Corner ser. nov.—Arbores parvae v. frutices, saepe epiphyticae v. sarmentosae, haud suffocantes. Stipula terminalis conspicua curvata gracilis. Lamina subcoriacea v. membranacea, acuminata v. caudata, integra. Receptaculis sicca contracta et rugosa, plerumque bracteis lateralibus paucis parvis

praedita: setis internis et cellulis scleroticis nullis. Tepala albida. Flores feminei et cecidiophori pedicellis induratis, tepalis linearibus v. subulatis. Cystolitha hypogena, raro amphigena. India usque ad insulas Solomon, 2 spp. *F. subulata* Bl. (typus), *F. armiti* King.

ser. **Cuspidatae** Miq. Hook. Lond. J. Bot. 7 (1848) 428.—ser. *Glabriusculifoliae* Sata (lectotype, *F. caudatifolia* Warb.), Monogr. (1944) 217, 220, 378.—Arbores parvae, frutices, v. sarmentosae. Stipula inconspicula. Lamina caudata, dentata v. integra, sicco nervis reticulatis supra leviter elevatis, saepe fusco-brunnea. Receptacula raro bracteis lateralibus praedita: cellulis scleroticis nullis. Tepala albida membranacea. Semina valde carinato-gibbosa. Cystolitha hypogena. India usque ad Malaysiam Occidentalem, 4 spp. Lectotypus, *F. cuspidata* Reinw. ex Bl. = *F. sinuata* Thunb. ssp. *cuspidata* (Reinw. ex Bl.) Corner.

I have taken *F. cuspidata* as lectotype because it agrees with Miquel's diagnosis of the series and obviously provided the name.

ser. **Minutuliflorae** Sata, Monogr. (1944) 217, 222, 378.—Arbores parvae v. frutices, saepe epiphyticae, plerumque luteo- v. brunneo-pilosae. Stipula inconspicua. Lamina caudata, basi saepe auriculata, dentata v. integra, membranacea. Receptacula saepe bracteis lateralibus parvis 1–2 praedita: cellulis scleroticis nullis. Tepala albida membranacea. Cystolitha hypogena, raro amphigena. Sumatra, Borneo, Philippines, Celebes, Moluccas, New Guinea, 3 spp. Lectotypus, *F. hispidulosa* Elmer (*F. aurita* Bl.).

ser **Fibrosifoliae** Corner ser. nov.—Ut ser. Minutuliflorae sed lamina fibris microscopicis sclereidiformibus in mesophylla copiosis praedita. Stipulae saepe conspicuae. Flores feminei et cecidiophori sessiles. Tepala rubra v. albida. Cystolitha amphigena v. hypogena. Burma, Thailand, Malaysia Occidentalis usque ad insulas Philippinenses et Moluccanas, 7 spp. Typus, *F. obscura* Bl.

This group is abundantly distinct in the microscopic feature of sclereid-like fibres excurrent from the vascular bundle-sheaths and permeating the whole mesophyll between upper and lower epidermis. It is a feature which can be observed very easily and quickly in a minute fragment of dried leaf-tissue cleared by placing in a drop of dilute potash on a slide and warming for a minute: the fibres appear like white worms under a low power of the microscope. The species are closely related and show, as any other natural group of *Ficus*, the common evolutionary trends in leaf and receptacle.

subsect. Sycidium ser. Prostratae Corner

F. semicordata B. Ham. ex J. E. Smith, Rees Cyclop. 14 (1810) n. 71.—*F. cunia* B. Ham. ex Roxb. Fl. Ind. 3 (1832) 561; Wight Ic. t. 648: (*F. cunea* B. Ham. ms.).—This is represented by two sheets in the Smith herbarium of the Linnean Society of London, namely n. 1610. 26 (narrow leaf) and 1610.27 (broad leaf, the *lectotype*). The name antedates *F. semicordata* Miq. for which *F. elmeri* Merr. must be used. The common name for the species has been *F. cunia,* of uncertain etymology, but it is spelled *F. cunea* on the labels of B. Hamilton's specimens.

var. **conglomerata** (Roxb.) Corner comb. nov.—*F. conglomerata* Roxb. Fl. Ind. 3 (1832) 559; Wight Ic. t. 669.—*F. cunia* B. Ham ex Roxb. var. *conglomerata* (Roxb.) Kurz, For. Fl. Br. Burma 2 (1877) 461.

F. koutumensis Corner sp. nov.—Arbor –9 m. alta, foliis symmetricis distichis. Ramuli, petioli, et costae (subtus) pilis albidis v. brunneis –1.5 mm. longis hispidi, nervuli pilis brevioribus: lamina supra pilis albidis appressis scabrida, glabrescens. Ramuli 4–6 mm. crassi, ulteriores 2–3 mm. Stipulae –17 mm. longae, puberulo-glabrescentes v. glabrae, subcaducae. Lamina 10–21 × 3–9.5 cm., oblongo-elliptica, apice acuminata –15 mm. longo, basi late cuneata v. rotundata symmetrica, denticulata v. serrulata, subcoriacea, supra scabrida, subtus hispido-scabrida, sicco brunnea: costis lateralibus utrinsecus 6–8, obliquis, intercostis –10, subtus leviter elevatis: costis basalibus utrinsecus 2–3 (–4), ad ¼–½ laminae elongatis, glandulis basalibus 2: petiolo 12–55 mm. longo. Receptacula ad ramulos efoliatos geocarpicos ut in *F. semicordata* J. E. Sm., stipulis plus minus persistentibus; pedunculo 3–10 mm. longo, albido-villoso dein glabro: bracteis basalibus in collare ternatis, 2–3 mm. longis, glabris v. appresse puberulis: corpore receptaculi 15–20 mm. lato, albido-villoso dein glabro, bracteis lateralibus nullis v. unico, ostiolo plano bracteis apicalibus planis 4–5 occluso: setis internis paucis albidis: cellulis scleroticis nullis. Flores feminei ut in *F. semicordata,* plus minus sessiles: tepala 3–4 libera rubra lanceolata, ovario equalia: ovario sessili v. breviter stipitato, rubro: stylo valde laterali, glabro, stigmate simplici. Semina laevia, vix carinata et vix gibbosa. Cystolitha hypogena v. supra vix evoluta. Annam, pr. Koutum, in silvis montium 1,000–1,800 m. alt.

Poilane 18220, mont. Mam Ray: 32027, pr. Moi de Tu-inh (typus, herb. Paris).

Lamina symmetrica ut in *F. prostrata* Wall. sed denticulata, scabrida, et hispida ut in *F. semicordata* J. E. Sm.: stipulis et seminibus intermedia.

subsect. Sycidium ser. Pungentes Corner

F. pungens Reinw. ex Bl. Bijdr. (1825) 478.—*F. myriocarpa* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 230, 296.—The type of *F. pungens* (Reinwardt 1486, Ternate) is sterile. I know of no way to distinguish sterile material surely of *F. minahassae* Teysm. et Binn. and *F. myriocarpa* Miq., but there are later collections of *F. myriocarpa* from Ternate and Morotai, whereas *F. minanassae* occurs to the westward (Talaud, Philippines, Celebes, North Borneo) and does not stretch into the Moluccas proper or to New Guinea, which is the domain of *F. myriocarpa*. Hence I identify *F. pungens* with *F. myriocarpa*. King mistook a Moluccan species of sect. Sycocarpus (*F. calcarata* Corner sp. nov.) for *F. pungens* Reinw. in which he was followed by Diels.

subsect. Sycidium ser. Phaeopilosae Corner

F. complexa Corner sp. nov.—Arbor –7 m. alta, latice albido, foliis longipetiolatis spiraliter dispositis. Ramuli et petioli pilis brunneis v. purpureis 1–3 mm. longis erectis v. curvatis rigidis strigosi, glabrescentes: costae subtus pilis brunneolis 0.5–1 mm. longis appressis v. patentibus, nervuli puberulo-scabridi: lamina supra pilis appressis rigidis sparsis, glabrescens. Ramuli 4–6 mm. crassi, glandulis subnodalibus deficientibus. Stipulae 15–25 × 9–15 mm., ovato-lanceolatae, persistentes, appresso-puberulae v. subglabrae v. ad carinam pilis erectis brunneis strigosae. Lamina 18–32 × 12–19 cm., late elliptica v. ovata, apice gracili acuminata –25 mm. longo, basi cordata, symmetrica, denticulata, utrimque scabrida, membranacea, sicco fusca et subtus griseo-viridis: costis lateralibus utrinsecus 5–7, plerumque glandula axillari praeditis, intercostis 5–10, subtus elevatis: costis basalibus utrinsecus 3–4, ad 1/3–½ laminae elongatis, glandulo axillari praeditis: petiolo 4–15 cm. longo. Receptacula axillaria, solitaria v. binata, etiam rami– et cauliflora ad ramulos congestos, internodis vix evolutis, –50 × 5 mm., efoliatos, maturitate brunneo-rubra: pedicello 4–15 × 3–4 mm., bracteis lateralibus dispersis 2–5 × 2–4 mm., appressis v. patentibus, haud ternatis, praedito: corpore receptaculi 10–13 mm. lato (16–20 mm., vivo), subgloboso, interne ob flores breves cavo, pilis albidis –1 mm. longis laxe hispido, glabrescenti scabrido, bracteis lateralibus appressis numerosis ovato-lanceolatis acutis

5–16 × 4–9 mm, receptaculis juvenilibus toto obscurantibus, ostiolo bracteis similibus erectis numerosis 4–8 mm. longis occluso: setis internis minutis sparsis: pariete crasso (4–5 mm., vivo), cellulis scleroticis nullis. Tepala 4–5 fusco-rubra, spathulata v. in floribus sessilibus ovato-lanceolata, libera, glabra. Flores masculi ostiolares sessiles, ordinibus 1–2 instructi: stamine 1, anthero minute mucronato, pistillodio nullo. Flores cecidiophori sessiles v. pedicellis glabris –1 mm. longis praediti, feminei subsessiles: ovario sessili albido: stylo glabro, stigmate subinfundibuliforme puberulo. Semina 1 mm. longa, lentiformia, laevia, vix compressa, subcarinata. Cystolitha hypogena: pili papillati. **Papua, in silvis montium 1,000–1,600 m. alt.**

Brass 23213, Milne Bay district, Maneau Range, Mt. Dayman; Carr 14023 (Lalu River), 14660 (Boridi), 15753 (Isuarava, *typus* herb. Br. Mus.).

F. conocephalifoliae Ridley affinis sed lamina latiori, plus ovato-cordata, receptaculi bracteis lateralibus longioribus floribus sessilibus v. breviter pedicellatis. An *F. eustephana* Diels, e specimine miserabili descripta ?.

F. porphyrochaete Corner sp. nov.—Arbor –12 m. alta, latice albido subseriflua, foliis longipetiolatis spiraliter dispositis. Ramuli, petioli, et receptacula setis purpureo-brunneis 1–4 mm. longis (ad costas et receptacula 1–2 mm.) irritantibus erectis hispidi, costae subtus pilis brunneolis plus minus appressis: lamina supra sparsim et appresse albido-hirsuta, glabrescens scabra. Ramuli 5–7 mm. crassi. Stipulae 15–35 × 6–11 mm., ovato-lanceolatae, persistentes, appresso-hirsutae. Lamina 23–40 × 11–20 cm., elliptico-obovata, apice acuminata –25 mm. longo, basi rotundato-cuneata v. subcordata, denticulata, membranacea, utrimque scabrida, sicco griseo-viridis, cyanea, v. brunneola: costis lateralibus utrinsecus 6–8, curvato-ascendentibus, glandula axillari praeditis, intercostis 6–12, subtus elevatis: costis basalibus utrinsecus 3, ad ¼–1/3 laminae elongatis, glandulis basalibus 2: petiolo 25–75 mm. longo. Receptacula axillaria et cauliflora in cumulis magnis (–60 receptaculis aggregatis) ad ramulos efoliatos congestos –50 × 5–10 mm., internodis vix evolutis, maturitate e brunneo rubescentia; pedicello 3–20 mm. longo, in receptaculis axillaribus brevi, bracteis lateralibus 1–2 (–3) dispersis, haud ternatis, ovato-lanceolatis puberulis, 1–2 mm. longis, praedito: corpore receptaculi 8–11 mm. lato (setis exclusis: 17–19 mm., vivo), subgloboso hispido glabrescenti, bracteis lateralibus paucis 1–2.5 × 3–5 mm., ostiolo bracteis numerosis erectis, externis ad apicem recurvatis, 1–1.5 mm. longis occluso: setis internis brevibus, brunneolis,

sparsis v. copiosis: cellulis scleroticis nullis. Tepala 4–6 fusco-rubra albomarginata oblonga libera glabra. Flores masculi ostiolares sessiles, ordine uno instructi: stamine 1, non mucronato, pistillodio nullo. Flores feminei et cecidiophori sessiles v. pedicellis albidis glabris –2.5 mm. longis praediti: ovario sessili albido-luteo: stylo glabro. Semina 0.8–1 mm. longa, lentiformia, subcarinata, laevia, hilo vix prominenti. Cystolitha amphigena: pili papillati. Papua, Solomon Islands, in silvis –500 m. alt.

Brass 24162, Papua, Milne Bay district, Kwagira River, Peria Creek (*typus,* Gray herb. Harvard): Carr 16381, Papua, Kokoda; J. H. L. Waterhouse B146, B146a (Bougainville Isl, Siwai), 236 (New Georgia).

F. complexae Corner affinis sed receptaculis minoribus setosis parvibracteatis, cystolithis amphigenis.

F. gul Laut. et K. Schum. Fl. Deutsch. Schutzgeb. Suds. (1901) 278.—*F. rudis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 222, 291 (non Pers.).—*F. keyensis* Laut. et K. Schum. id. 270.—*F. manilensis* Warb., Perkins Fragm. Fl. Philip. 3 (1905) 199.—This is a widespread, common, and variable species extending from North Borneo and the Philippines to New Guinea and New Britain.

var. **lasiocarpa** Corner v. nov.—Receptacula pilis albidis, luteolis, v. brunneolis 1–2 mm. longis dense villosa, bracteis lateralibus obscuratis. Morotai, Halmaheira, Netherlands New Guinea. Aet 218 (Exp. Lundequist) et BW 6889, SW New Guinea, Kaimana; A. W. Herre 636, Manokwari; Idjan 183, Halmaheira, Goal; Kanehira et Hatusima 13353, Momi, 60 miles south of Manokwari (*typus,* herb. Bogor); Kostermans 1348 (Morotai). 2619 (Manokwari, Warnapi).

var. **solomonensis** Corner v. nov.—Ramuli, petioli, et costae pilis 1–2 mm. intensius brunneis villosi. Receptacula pilis brunneis –0.5 mm. longis hispida, 9–12 mm. lata, bracteis lateralibus 1.5–3 mm. longis, bracteis apicalibus 1–1.5 mm. longis projicientibus: pedicello –12 mm. longo. Tepala ad apicem pilosa. Solomon Islands.

Brass 2578, San Cristoval, Waimamuru; Kajewski 1651, 1712 (Bougainville, Kupei Gold Field; *typus* 1651, herb. Kew) 2118 (Bougainville, Buin, Koniguru), 2796 (San Cristoval, Puepue River).

A v. *gul* receptaculis majoribus et bracteis apicalibus projicientibus differt: ad *F. porphyrochaete* Corner tendit.

subsect. Sycidium ser. Copiosae Corner

F. montana Burm. f., Fl. Ind. (1768) 226.—*F. quercifolia* Roxb. Fl. Ind. 3 (1832) 534; Wight Ic. t. 646; King, Ann. R. Bot. Gard. Calc. 1 (1888) 77, pl. 95.—This is undoubtedly the correct name for *F. quercifolia* Roxb., though Burmann's type (herb. Delessert, Geneva) had been misnamed *F. ampelas.*

var. **purpurascens** (Bl.) Corner comb. nov.—*F. purpurascens* Bl. Bijdr. (1825) 471; King, Ann. R. Bot. Gard. Calc. 1 (1888) 75, pl. 93.—Leaves purple or violet beneath. Java.

A recent collection (Meijer 3981, Tjibodas) proves that this is merely a variety of *F. montana.* Blume's type is at Leiden.

F. madurensis Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 222, 291.—*F. smaragdina* S. Moore, J. Bot. (1925) 171.—*F. copiosa* Steud. *sensu* Ridley, Fl. Mal. Pen. 3 (1924) 340.—This has a more tree-like habit than *F. montana,* and is truly cauliflorous, with more persistent stipules, larger leaves, and broader tepals; and it is a plant of high forest, unlike *F. montana.* However, it requires field-study and it would be desirable to grow it along with *F. montana, F. andamanica, F. wassa,* and *F. copiosa,* which may be almost impossible to distinguish from sterile material. Because it has been misunderstood, I cite the collections which I refer to *F. madurensis:*—

Tenasserim:—Beddome 7489 (*F. smaragdina,* type). Thailand:—Kostermans 176, Kwae Noi Exped., pr. Wangka. Perak:—Wray 1732, Sing. F.n. 12728, Curtis s.n. May 1890, (Maxwell's Hill). Pahang:—Ridley 13719 (Telom), Sing. F.n. 31335, 32941 (Cameron Highlands). Selangor:—Ridley 8496, Robinson and Kloss s.n. 7 Sept., 1917, (Ginting Simpah). Negri Sembilan:—Ridley s.n. 23 Dec., 1920 (Bt. Tangga), Sing. F.n. 9856 and Furtado s.n. 16 June, 1937 (Ulu Bendol). Sumatra:—Beccari 772 (Padang; referred to *F. copiosa* Steud. by King); Borssum-Waalkes 1060 (Krakatau); Lorzing 4632 (Sibolangit), v. Steenis 9850 (Atjeh, Gajolanden). Java:—Zollinger 3803.4 (It. sec., Br. Mus.); Horsfield s.n. (Br. Mus.); Reinwardt s.n. (Utrecht, det. F. subcrenata Miq. ined.) Madura:—de Vriese s.n. (*type,* Leiden),; Zollinger 2449.

It looks as if the species has become extinct in Java.

var. **angustifolia** Corner v. nov.—Lamina 20–25 × 5–6.5 cm. lanceolata. Sumatra.

Krukoff 4178, Asahan, Masihi For. Res. (*typus,* herb. Leiden); Lorzing 5662 (Sibolangit).

F. andamanica Corner nom. nov.—*F. macropoda* Kurz, Prelim. Rep. For. Veg. Pegu App. A (1875) p. cxxiii; For. Fl. Br. Burma 2 (1877) 459, (non Miquel).—This is close to *F. madurensis* but has a longer fig-pedicel, internal bristles, puberulous tepals, and no ovary in the male flower. These are small points but they show that the two are not identical, and both require further field-study. In having the reticulate seed, it may connect *F. exasperata* Vahl (Peninsular India, Ceylon, East Africa) with *F. madurensis* and *F. montana* of Western Malaysia. I have seen the following collections:—

South Andaman Isl.:—Kurz s.n. and n.2 (syntypes, but with n.2, at Kew, are mixed figs of *F. variegata* Bl.); King's collector s.n. and n. 326; Parkinson 411. Barren Isl.; Prain s.n. 1891, Narcondam, common. Gt. Cocos Isl.:—Prain s.n. (det. *F. brevicuspis* Miq.).

F. subsidens Corner sp. nov.—Frutex laxe ramosa, ramulis decumbentibus v. repentibus, internodis elongatis, foliis longipetiolatis laxe spiraliter dispositis, scabridula. Ramuli 3–4 mm. crassi. Stipulae caducae. Lamina 17–22 × 9–11.5 cm., elliptica, apice breviter acuminata –10 mm. longo, basi late cuneata, denticulata, utrimque scabrida, membranacea, sicco brunneo-viridis: costis lateralibus utrinsecus 8–10, intercostis strictis –11, subtus leviter elevatis: costis basalibus utrinsecus 1 (–2), brevibus, glandulis basalibus 2: petiolo 30–70 × 3–4 mm. Receptacula binata, axillaria ad ramulos frondosos et ad caules repentes defoliatos, scabridula, maturitate externe et interne roseo-rubra: pedicello 5–8 mm. longo, bracteis lateralibus 2–3 parvis dispersis, haud ternatis: corpore receptaculi 6–8 mm. lato (10–11 mm., vivo), subgloboso, bracteis lateralibus parvis paucis, ostiolo subdepresso bracteis apicalibus umbonatis 4–5 occluso: setis internis et cellulis scleroticis nullis. Flores masculi et cecidiophori? Flores feminei sessiles v. pedicellis glabris –1mm. longis praediti: tepala 3–5 lineari-lanceolata, leniter gamophylla, glabra, albida: ovario sessili v. substipitato, parte inferiori carnoso: stylo glabro. Semina 1–1.2 mm. longa, lentiformia, vix compressa, subcarinata, laevia. Cystolitha ut pili microscopici amphigena. North Borneo (Kinabalu), inter lapides riparia, c. 1,500 m. alt.

Sing. F.n. 26443, Kinataki River, leg. C. E. Carr (*typus*, herb. Singapore); Clemens 32402, pr. mont. Nunkok.

Species notabilis, in distributione singularis, *F. montanam* Burm. f. revocans sed semina haud reticulata et lamina majoribus, intercostis pluribus.

F. copiosa Steud. var. **pubescens** Corner v. nov.—*F. krausseana* Rechinger, Fedde's Rep. 11 (1912) 180.—*F. acanthophylla* Summerh. J. Arn. Arb. 10 (1929) 142.—Ramuli, petioli, lamina (subtus), et receptacula juvenilia pilis albidis -1 mm. longis villosi v. hispiduli, plus minus muriculati. Moluccas, New Guinea, New Britain, New Ireland, Solomon Islands, Queensland.

Moluccas:—Beguin 1827, Boger 9 (Halmaheira); Kostermans 1339 (Morotai); Labillardiere s.n. (Boeroe et Amboina). New Guinea:—Brass 1388, 8749, 24127; Carr 11728, 11732, 16445; Hoogland 4209; Kostermans 310 (*typus,* herb. Leiden), 493, 2853; NGF 861. New Britain:—Waterhouse 247. New Ireland:—Labillardière s.n. Solomon Isl.:—Brass 2580 (San Cristoval), 3193 et 3196 (Ysabel); Kajewski 1836, Rechinger 4713, Waterhouse 156, 226, B324, 801 (Bougainville). Queensland:—S. T. Blake 14976; Kajewski 1178 et C. T. White 8021 (det. *F. magnifolia* F.v.M.).

Ut species nullo modo distinguenda.

F. wassa Roxb. Fl. Ind. 3 (1832) 539; Wight Ic. t. 666.—*F. duriuscula* King, Ann. R. Bot. Gard. Calc. 1 (1888) 155, pl. 195.—*F. eulampra* K. Sch. Fl. Deutsch. Schutzgeb. Suds. (1901) 279.—*F. lamprophylla* Laut. et K. Schum. id. 271.—*F. portus-finschii* Warb. in Laut. et K. Schum. Nachtr. Fl. Schuztgeb. (1905) 250.—*F. rhodocarpa* Summerh. J. Arn. Arb. 10 (1929) 150.—*F. anggica* Diels, Engl. Bot. Jahrb. 67 (1935) 198.—*F. wassa* is identifiable from Roxburgh's specimen (herb. Martii, Brussels), his description, and Wight's figure. *F. copiosa* Steud. is identifiable from Roxburgh's description of *F. polycarpa* Roxb. (non Jacqu.) and Wight's figure (t. 632), but I have found no specimen of Roxburgh's. I treat *F. copiosa* in the customary sense, as the species with large leaves and figs, but Buch. Hamilton 2426 (at Edinburgh), labelled "F. polycarpa Roxb. Hort. Beng. 66: colitur in horto prope Calcuttam botanico e Moluccis", resembles *F. wassa* rather than *F. copiosa.* Wassa is a common name in Eastern Malaysia for any rough-leafed fig, comparable with *ampelas* in Western Malaysia, and may signify *F. ampelas, F. melinocarpa, F. heteropoda, F. copiosa, F. wassa* or any other.

var. **nubigena** (Diels) Corner comb. nov.—*F. nubigena* Diels, Engl. Bot. Jahrb. 67 (1935) 209.—*F. caroli* Diels id. 200.—Diels indicated that *F. caroli* might have to be reduced to *F. nubigena.* Many specimens are now at hand for the common *F. wassa*

and several of these are intermediate to *F. nubigena* which, in fact, differs merely in the following, rather vague, and, in some respects, probably phenotypic characters:—

Leaves mostly decussate; lamina elliptic, often dentate; petioles 2–22 mm., rather short. Tepals dark red, fading pinkish white. New Guinea, mountain and mossy forest, 1,300–2,400 m. alt.

Brass 5098; BW 3087, 3101; Carr 13304, 13630, 13656, 14211, 14342, 14866, 15979, 16095, 16402; Eyma 4913, 5319, 5424; Kanehira et Hatusima 13637; Ledermann 11826 (*F. caroli*, type), 11970, 12535 (*F. nubigena*, type), 12901; Nielsen 808; NGF 7847.

var. **obversifolia** (Miq.) Corner comb. nov.—*F. ampelas* Burm. f. var. *obversifolia* Miq. Ann. Mus. Bot. Lugd, Bat. 3 (1867) 272.—*F. reticulatissima* S. Moore, J. Bot. (1925) Suppl. 108.—Scabridissima. Ramuli, petioli, et costae (subtus) pilis pustulatis –0.5 mm. longis muriculati. Flores, Timor, Halmaheira, Morotai.

Timor: Forbes 3551, 3704, 3294. Flores:—Elbert 4321. Halmaheira:—Nedi 221, Teysmann 5649 (*typus*, herb. Leiden). Morotai:—Kostermans 1487.

Muriculata ut *F. copiosa* Steud. sed in omnibus partibus minor ut in *F. wassa*.

F. balica Miq. var. **colfsii** Corner v. nov.—Ramuli, petioli, et receptacula albido-villosi, haud glabrescentes: lamina subtus molliter villosa. Ramuli 2–4 mm. crassi. Lamina basi cordata: costis lateralibus 6–8 v. 8–11. Receptacula pedicellis 8–30 mm.; corpore 12–15 mm. lato. Flores sessiles v. pedicellis rubris –1 mm. longis praediti; tepala 4–5 rubra libera oblonga, glabra v. puberula. Flores masculi ordinibus duobus instructi: stamine 1 (–2), pistillodio nullo. Lombok, Sumbawa, Flores, in silvis ad 1200 m., alt.

Colfs 295, Sumbawa (*typus*, herb. Leiden); Elbert 4220, Flores; Rensch 645, Sumbawa; Elbert 895, 896, 1651, Lombok.

F. griseifolia Corner sp. nov.—Arbor –8 m. alta, latice seriflua, foliis laxe spiraliter dispositis. Petioli, laminae pagina superior, et costae (subtus) pilis rigidis conicis erectis –0.5 mm. longi sparism muriculati, nervuli subtus scabriduli; ramuli stipulaeque glabri. Ramuli 2–3 mm. crassi, fusco-brunnei. Stipulae 5–9 mm. longae, graciles, liberae, caducae. Lamina 8.5–17.5 × 5–12 cm., ovato-elliptica, apice acuminata 12–22 mm. longo, basi cordata v. rotundata, saepe subasymmetrica, serrulato-denticulata, rigide membranacea, utrimque scabrida, sicco griseo-olivacea v. plumbea: costis lateralibus utrinsecus 5–8, intercostis strictis –8, subtus elevatis: costis basalibus utrinsecus

2–3, ad 1/3 laminae elongatis, glandulis nullis v. indistinctis: petiolo 20–55 × 2 mm., glandula subnodali praedito. Receptacula rami- et cauliflora ad ramulos efoliatos congestos –30 × 3–4 mm., basi –10 mm. latos, internodis vix evolutis: pedicello 15–20 × 1 mm., gracili, sparsim muriculato v. glabro, bracteis lateralibus glabris subacutis 1–3, 0.5–1 mm. longis, dispersis, haud ternatis: corpore receptaculi 7 × 6 mm. (immaturo), ellipsoideo, subscabrido, bracteis lateralibus 1–2 parvis appressis, ostiolo bracteis apicalibus erectis numerosis acutis glabris 1–1.5 mm. longis occluso: setis internis –1 mm. longis, flexuosis, copiosis, albidis: cellulis sclerotocis nullis. Tepala 4–5 fusco-rubra ovata-lanceolata libera glabra: florum pedicelli albidi glabri. Flores masculi ostiolares, sessiles v. breviter pedicellati, ordinibus duobus instructi: stamine 1, non mucronato, pistillodio plus minus bene evoluto. Flores cecidiophori sessiles v. pedicellati: ovario sessili, albido-luteo, ad basim lateris stylaris rubro-marginato. Cystolitha hypogena. Papua (Hoogland 3993, Alola, Iora valley, pr. Kokoda, 1200 m., alt.; *typus,* herb. Lae).

Ut *F. gul* Laut. et K. Schum. sed plus minus glabra; muriculata ut *F. copiosa* Steud; bracteis apicalibus erectis distinguenda.

F. primaria Corner sp. nov.—Arbor –20 m. alta: cortice griseo-brunneo pustulato, 12 mm. crasso: latice albido serifluo; foliis spiraliter dispositis. Ramuli, petioli, et costae (subtus) pilis rigidis patentibus albidis 1–2 mm. longis hispidi, nervuli pilis brevioribus v. puberuli: lamina supra hispido-scabrida. Ramuli 5–6 mm. crassi, brunnei. Stipulae 5–10 mm. longae, puberulae, caducae. Lamina 17–24 × 8–11 cm., elliptico-obovata, breviter attenuato-acuminata, basi rotundato-subcordata, denticulata, membranacea, utrimque scabrido-hispidula, sicco brunneo-viridis: costis lateralibus utrinsecus 9–11, intercostis strictis –11, subtus valde elevatis: costis basalibus utrinsecus 2–3, ad ¼ laminae elongatis, glandulis basalibus 2: petiolo 36–65 mm. longo. Receptacula cauliflora ad ramulos breves congestos 8–14 mm. crassos, internodis vix evolutis: pedicello –55 mm. longo, sparsim hispidulo, bracteis lateralibus 3, 1.5 mm. longis, circum medium pedicelli dispersis, haud ternatis: corpore receptaculi 26 × 22 mm. (immaturo), pyriformi, bracteis lateralibus nullis, scabrido-hispidulo pilis –0.3 mm. longis, ostiolo c. 5 mm. lato bracteis apicalibus parvis numerosis erectis v. recurvatis, occluso: setis internis brevibus copiosis albidis: cellulis scleroticis nullis. Flores feminei (juveniles) sessiles v. pedicellati: tepala

4–5 libera glabra oblongo-spathulata, pallide carnea: ovario sessili albido: stylo valde laterali, glabro v. sub stigmate clavato piloso. Cystolitha hypogena. Terr. New Guinea (Hoogland 4958, Madang district, Kokun River, pr. Jal, Gogol River Valley: *typus:* herb. Lae).

Species nobilis ut *F. montana* gigantea, sed ob flores masculos incognitos sedi incertis, forsan *F. griseifoliae* Corner affinis.

subsect. Sycidium ser. Scabrae Miq.

F. cumingii Miq. var. **androbrota** (Summerh.) Corner comb. nov.—*F. androbrota* Summerh. J. Arn. Arb. 10 (1929) 143.—*F. dichroa* Summerh. id. 147.—This New Guinea variety differs from v. *cumingii* merely in the broadly elliptic lamina, 4–8 cm. wide, the numerous intercostals (3–11), the glabrous flower-pedicels, and the presence of a gall-ovary in the stalked male flowers adjoining the gall-flowers (not in the sessile male flowers round the orifice). Thus it approaches v. *worcesteri* with larger lamina. Some Philippine collections of v. *terminalifolia* (Elm.) Sata (=*F. terminalifolia* Elm). match those of v. *androbrota* in leaf and glabrous flower-pedicels: thus, it may not be possible to distinguish seed-plants.

Aet (Exp. Lundquist) 520; Branderhorst 53, 128 (det. *F. dichora*); Brass 800 (*F. androbrota,* type), 1190 (*F. dichroa,* type), 8298, 8548; Carr 11208; Koch 4.

var. **angustissima** (Merr.) Corner v. nov.—*F. angustissima* Merr. Govt. Lab. Publ. Philip. 29 (1905) 11.—This differs from v. *cumingii* in the linear acuminate lamina (14–32 × 0.5–1.5 cm.) with 35–60 pairs of lateral nerves. It appears to be a shrub –3 m. high, but whether a sapling-form, a coppiced form, or a distinct variety is uncertain: a few collections are intermediate with v. *cumingii.* It is recorded from Luzon and Mindanao.

Merrill 2696 (*type*); Elmer 9357 (not seen), 13920; PNH 11067; Herb. Univ. Philip. 4907; Vidal 3818.

var. **worcesteri** (Merr.) Corner comb. nov.—*F. worcesteri* Merr. Philip. J. Sci. Bot. 9 (1914) 274.—This differs from v. *terminalifolia* (Elm.) Sata in the larger lamina (13–37 × 5–17 cm.; 4–17 × 1.5–6 cm. in v. *terminalifolia*) and the glabrous flower-pedicels. It lacks the gall-ovary in all the male flowers. That it is not a large-leafed sapling is shown by its sporadic distribution and the fact that small-leafed saplings of v. *terminalifolia* are known. Some collections, including the type, have pale pink tepals, which suggests that v. *worcesteri* links with *F. tonsa* Miq.

Bur. Sci. 7178 (Cavilli Isl. Sulu Sea; *type*); 24309, 24513 (Samar, Catubig River); 31029, 31067, 31369 (Panay, Capiz province, Jamindan), PNH 14315 (Samar, Mt. Mahagua).

F. fiskei Elmer var. **multinervia** Corner v. nov.—Sparsim muriculata. Lamina scabrida, basi utrimque cordata sed asymmetrica: costis lateralibus utrinsecus 8–11, costis basalibus haud elongatis. Tepala subrubra. Mindanao (Bur. Sci. 49506, Davao province, Mt. Mayo, det. *F. hemicardia* Merr., typus, herb. Bogor).

In v. *fiskei,* v. *cebuensis* Merr., et v. *laevifolia* Merr. costae laterales utrinsecus 5–8, basales ad 1/3–½ laminae elongatae. Var. *multinervia* foliis *F. oleraceae* Corner (Solomon Isl.) simillima, sed pilis muriculatis et setis internis deficientibus *F. fiskei* constat.

F. riedelii Miq. var. **minor** Corner v. nov.—Receptacula minora 6–8 mm. lata, pilis conicis –0.5 mm. longis vestita, bracteis lateralibus et apicalibus minoribus 1–1.5 mm. longis, pedicello 0–2 mm. longo: setis internis paucis brevibus. Lamina minor v. angustior. Frutex v. arbor parva. Celebes.

Beccari s.n., Kandari (R.Ist. Fir. 9346, det. *F. obscura* Bl. by King); Eyma 413, subdiv. Enrekang, inter Pasoei et Rante Lomo, 600–1,300 m. alt. Eyma 3408, Menado, subdiv. Kolone Dale, inter Koroworo et Tompira (*typus*, herb. Leiden); Elbert 3329 (Kabaena Isl.), 3048 (distr. Rumbia, pr. Zankaya), S.E. Celebes; Kjellberg 357, 361 743, Kendari; 1385, Enrekang; 3779, Malili.

F. ampelas Burm. f. Fl. Ind. (1768) 226; emend. Miq. Hook. Lond. J. Bot. 7 (1848) 428 (excl. syn. Rheede).—There are two sheets in herb. Delessert (Geneva) named in Burman's hand *F. ampelas*. One, which I will call A, is the usual interpretation as given by Miquel, King, and Valeton. The other, which I will call B, is *F. montana* Burm. f. (= *F. quercifolia* Roxb.), though a leaf of *F. ampelas* is also attached to B. Both have been labelled "F. ampelas Burm. type" by Hochreutiner.

A. This sheet I have selected as the type because it maintains current usage and because it has written on it the full citation given by Burman, that is:—

> Folium politorium.
> Varinga Rumph. Herb. lib. 6 cap. 69 T63.
> Terega H. Mal. tom. 3 p. 79 tab. 60.

The reference to Terega is to *F. montana* Burm. f. and was excluded by Miquel (1848).

B. This sheet bears the single erroneous citation "Rumph 4 p. 128 tab. 61", which should read "tab. 63". The specimen is typical *F. montana* with reticulate seed, and is to be excluded from *F. ampelas.*

The name was published as *F. ampelos,* but this is clearly a misprint for Burman wrote *F. ampelas* unmistakably on both sheets, and it is etymologically wrong. Miquel and King used the correct *F. ampelas.*

var. **linearis** Corner v. nov.—Frutex –2 m. altus. Lamina 3–6.5 × 0.5–0.9 cm., lineari-oblonga, subacuta, rigide coriacea, scabridissima: costis lateralibus utrinsecus 10–20, intercostis nullis: costis basalibus brevibus: petiolo 2–5 mm. longo. Receptacula 4 mm. lata: pedicello 2–3 mm. longo, bracteis lateralibus 2–3 dispersis. Stomata immersa. Celebes (Kjellberg) 3773, Waroe; *typus,* herb. Stockholm).

F. fallax Miq. (Celebes) revocans, sed setis internis, tepalis puberulis *F. ampelas* constat.

var. **soronensis** (King) Corner comb. nov.—*F. exasperata* Roxb. Fl. Ind. 3 (1832) 555.—*F. biglandulosa* Miq. Hook. Lond. J. Bot. 7 (1848) 229 (haud Fl. Ind. Bat. 1, 2, 1859, 298).—*F. asperior* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 291.—*F. soronensis* King, J. As. Soc. Beng. 55, 2 (1887) 411.—*F. blepharisepala* Warb. in Laut. et K. Schum. Nachtr. Fl. Schutzgeb. (1905) 246.—Tepala ciliato-puberula: florum pedicelli saepe hispiduli. Corpus receptaculi saepe bracteis lateralibus 1–2 praeditum. Lamina scabrida v. sublaevis, saepe subsymmetrica: costis lateralibus utrinsecus 6–9. Moluccas, Key Isl., Aru, New Guinea, New Britain.

Varietas orientalis plurinervia, in Moluccis specimina intermedia.

F. guyeri Elmer var. **sibuyanensis** (Elmer) Corner comb. nov.—*F. sibuyanensis* Elmer, Leafl. Philip. Bot. 4 (1911) 1319.—Lamina 5–15 × 3–8 cm., elliptica v. ovato-elliptica, apice acuminata 8–24 mm. longo v. subcaudata, laevis v. scabrida: costis lateralibus utrinsecus 3–6: petiolo 3–10 mm. longo. Pedicelli receptaculi 3–5 mm. longi, v. 15–18 mm. Luzon, Sibuyan, Panay, Samar.

Elmer 12236 (*typus*); Bur. Sci. 14509, 22811, 30846, 32284, 47345.

Ob setas internas longas *F. guyeri* ascripta, sed lamina ut in *F. ampelas* Burm. f.

F. cauta Corner sp. nov.—Arbor –15 m. alta, ? latice subnullo, foliis distichis, glabra. Ramuli 1.5–2 mm. crassi, straminei dein brunneoli. Stipulae 6–15 mm. longae, graciles. Lamina 8–20 × 3.5–7.5 cm., obovato-elliptica, apice acuminata –12 mm. longo, basi cuneata, integra v. dentato-angulata, membranacea v. subcoriacea, laevis v. subtus subscabrida, sicco griseo-viridis: costis lateralibus utrinsecus 3–5 (–6), curvato-ascendentibus, intercostis 1–4 laxis: costis basalibus utrinsecus 1, ad 1/3–½ laminae elongatis, glandulis basalibus 2 exiguis: petiolo 6–20 mm. longo. Receptacula axillaria solitaria: pedunculo 1–8 mm. longo: bracteis basalibus in collare ternatis, parvis, caducis: pedicello 2–15 mm. longo: corpore receptaculi 13–17 mm. lato (immaturo), bracteis lateralibus nullis, ostiolo plano bracteis apicalibus parvis numerosis occluso: setis internis et cellulis scleroticis nullis. Tepala 3–4 albida libera glabra, lanceolata v. oblonga. Flores masculi ostiolares, ordinibus duobus instructi, sessiles v. pedicellati: stamine 1, pistillodio minuto v. nullo. Flores feminei et cecidiophori sessiles v. pedicellis –1.5 mm. longis praediti: ovario sessili, pallido, stylo glabro. Semina 1–1.2 mm. longa, lentiformia, valde carinata, laevia. Cystolitha hypogena. Celebes, in silvis –1,200 m. alt.

Bunnemeyer 11477, Lombasang (*typus,* herb. Leiden); NIFS bb. 13517, Manado, Kakaskassen (det. *F. rostrata* Lam.); Forman 350, G. Lokon, Tetepamgan, Minahassa; Kjellberg 2602 (Kosali Porema), 2691 (Porema); Koorders 19255, 19348, Minahassa, Menado; Reinwardt 1563, Minahassa; Sarasin 603 (det. F. paucinervosa Warb. ms., non Merrill); Teysmann 14022, Bonthain.

Lamina ut in *F. uniglandulosa* Wall. sed cellulis fibrosiformis deficientibus, habitu et receptaculis toto dissimilis. Affinitas incerta, forsan *F. ulmifoliae* Lam.

F. goniophylla Corner sp. nov.—Arbor –10 m. alta, foliis brevipetiolatis distichis. Ramuli, petioli, et nervi pilis conicis –0.3 mm. longis sparsim hispiduli. Ramuli 1.5 mm. crassi, fusco-brunnei. Stipulae 2–3 mm. longae, perbreves, caducae. Lamina 3–9 × 1.7–4 cm., anguste elliptica, inequilateralis, utroque lobis brevibus 1–2 subangulatis, apice attenuata, basi cuneata, membranacea, utrimque scabrida, sicco griseo-viridis: costis lateralibus utrinsecus 3–4(–5), rectangulatis, subtus elevatis, intercostis nullis: costis basalibus utrinsecus 1, ad ¼–1/3 laminae elongatis, glandulis basalibus 2: petiolo 2–4 mm. longo. Receptacula cauliflora ad ramulos breves congestos efoliatos, pilis erectis 0.5 mm. longis hispidula, maturitate brunnea intus

rubescentia: pedicello 20–30 mm. longo, sursum gradatim dilatato, bracteis lateralibus 2–3 parvis dispersis: corpore receptaculi 20 mm. lato, obconico, bracteis lateralibus parvis 1–2 dispersis, ad apicem receptaculi applanatum numerosis umbonatis confertis 2–3 mm. longis, appressis v. incurvatis, ostiolo parvo plano bracteis apicalibus minoribus erectis occluso: setis internis brevibus sparsis albidis: cellulis scleroticis nullis. Tepala 4 oblonga, raro bifida, libera, glabra, albida. Florum pedicelli longi, glabri, in cecidiophoris 1.5–4.5 mm. Flores masculi ordinibus 2–3 instructi: stamine 1, pistillodio nullo. Ovarium sessile albidum. Cystolitha hypogena. Celebes (Kjellberg 1925, Todjamboe, c. 1,200 m. alt., in silvis: *typus,* herb. Stockholm).

Species insignis, foliis *F. tinctoriam* Forst. f. subsp. *gibbosam* (Bl.) Corner revocantibus, receptaculis *F. gul* Laut. et K. Schum., sed tepala albida. Planta feminea inquirenda.

F. melinocarpa Bl. var. **hololampra** (Diels) Corner comb. nov.—*F. hololampra* Diels, Engl. Bot. Jahrb. 67 (1935) 201.—*F. collinsii* Elmer, Leafl. Philip. Bot. 9 (1937) 3468.—Glabra sed scabridula v. foliis supra nitidis et laevibus. Receptacula setis internis praedita.

This is merely the glabrous state of *F. melinocarpa,* co-extensive from Sumatra to the Solomon Islands, but more abundant, apparently, in New Guinea. Intermediates with varying indumentum occur.

F. trachypison Laut. et K. Schum. var. **pallida** Corner v. nov.—Frutex v. arbor –15 m. alta, foliis distichis. Ramuli, petioli, et receptacula scabridi, haud v. vix hispiduli. Lamina tenuior, sicco pallidior griseo-viridis, intercostis subtus vix elevatis. Tepala albida, apice hirta. Terr. New Guinea, Papua, Solomon Isl. (Bougainville).

Ramuli 1–2 mm. crassi, brunneo-badii. Stipulae parvae caducae. Lamina 4–18 × 2.5–8.5 cm., elliptica, apice acuto attenuata v. subacuminata, basi late cuneata v. uno latere subcordata, subsymmetrica, denticulata v. integra, utrimque scabrida: costis lateralibus utrinsecus 5–9, intercostis –9: costis basalibus utrinsecus 1–2, ad ¼–1/3 laminae elongatis, glandulis basalibus 2: petiolo 4–12 mm. longo. Receptacula axillaria et ad ramulos efoliatos fasciculata: pedunculo 2–5 mm. longo: bracteis basalibus ternatis 0.5 –1 mm. longis: corpore receptaculi 6–9 mm. lato, globoso, bracteis lateralibus nullis: setis internis albidis copiosis brevibus: cellulis scleroticis nullis. Semina reticulata.

Brass 25346, Normanby Isl., Waikaiuna (*typus,* Gray herb. Harvard); A. W. Herre 223, Huon Gulf; Hoogland 3828, Terr.

New Guinea, north division, pr. Dobodura; Hoogland 4240, Terr. N.G., north division, Tufi subdistrict, pr. Guragura; NGF 5636, Lae; J. R. Saunders 39, Terr. N.G., north division, Tufi subdistrict, pr. Oi-ai on Penari-track; J. H. L. Waterhouse 32, Bougainville, Siwai.

Varietas incertae sedis propter affinitatem diversam, vix species ipsa. Facies ut *F. ampelas* Burm. f. var. *soronensis* (King) Corner sed differt in seminibus reticulatis, bracteis pedunculi basalibus ternatis, cellulis scleroticis in pariete receptaculi nullis, intercostis numerosis, qui sunt *F. melinocarpae* Bl. et *F. trachypison* proprii. Lamina parva et receptaculum parvum ut *F. trachypison*, sed eo *F. storckii* Seem. (Fiji) revocans. Plantae vivae juvenes et in statu cauliflori inspiciendae.

F. tonsa Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 234, 297.—Celebes, Talaud Isl.

Riedel s.n., Menado (HB 5705, *typus*); Boschpr. st. Cel/II—405, Malili, Kawata; Koorders 19057, 19063, 19193, 19247, 19274, Minahassa; Sarasin 588, Minahassa, Tomohon; Teysmann 11976 (Pangkadjena), 12648, 12737 (Balek Angin).

Lam 2627, Talaud, Karakelang, east of Beo; 3125, Talaud, Salibabu, east slope of G. Ajambana.

This is a large, but little known, tree relating *F. todayensis* Elmer and *F. irisana* Elmer of the Philippines with *F. leptoclada* Benth. of Queensland, through *F. tonsa* v. *leptodictya* of New Guinea. They may, indeed, be varieties of one species, but v. *tonsa* is characterised by sunken stomata.

var. **aspera** Corner v. nov.—Lamina 5–16 × 2–5.5 cm., utrimque scaberrima, anguste elliptica, breviter acuminata, basi subsymmetrica, uno latere cuneata altero subrotundata, apicem versus denticulata: costis lateralibus utrinsecus 5–8, intercostis strictis –8: costis basalibus 1 + 2, ad ¼–½ laminae elongatis, glandulis basalibus 2: petiolo 3–8 mm. longo. Receptacula minora, 8–10 mm. lata, scabra, bracteis lateralibus nullis: pedunculo 1.5–2.5 mm. longo: setis internis –1 mm. longis, copiosis albidis: cellulis scleroticis in pariete receptaculi interno copiosis. Tepala 4–5 rubra glabra. Cystolitha amphigena: stomata superficialia. Terr. New Guinea (NGF 4863, East Highlands, pr. Nondugl, arbor parva in querceto: *typus*, herb. Lae).

Ut forma *F. trachypison* Laut. et K. Schum. angustifolia, sed setis internis longis et cellulis scleroticis copiosis, bracteis lateralibus nullis ad *F. tonsam* pertinens.

var. **leptodictya** (Diels) Corner comb. nov.—*F. leptodictya* Diels, Engl. Bot. Jahrb. 67 (1935) 196.—Costae basales ad ⅓—½ laminae elongatae. Stomata superficialia. New Guinea.

Brass 27291, Fergusson Isl., Agamoia: Carr 14799 (Boridi), 16059 (Isuarava); Eyma 4355, 4534, Wissel Lake; Hoogland 3914, Kokoda; Ledermann 12826, Sepik (typus); NGF 4183, Sogeri.

A var. *tonsa* vix distincta sed in regione novoguineensi et ad *F. wassa* Roxb. v. *nubigena* (Diels) Corner approximans.

var. **subcordata** Corner v. nov.—Folia applanata disticha. Lamina 5–13 × 1.5–4.5 cm., anguste elliptica v. ovato-lanceolata, acuta v. subacuminata, basi rotundata v. subcordata, symmetrica, subscabrida: costis lateralibus utrinsecus 7–10, intercostis 2–4: costis basalibus utrinsecus 2, brevibus: petiolo 3–10 mm. Receptacula axillaria, solitaria, glabra, 9–10 mm. lata, bracteis lateralibus nullis: pedunculo 7–15 × 1 mm.: bracteis basalibus ternatis, 1 mm. longis: pedicello 1.5–8 mm. longo: setis internis brevibus copiosis: cellulis scleroticis nullis. Flores feminei sessiles v. pedicellis rubris glabris praediti: tepalis 4–5 fusco-rubris, apice hispidulis: stylo puberulo. Semina 1 mm. longa, lentiformia, subcarinata, laevia. Stomata superficialia. Solomon Isl. (Kajewski 1657, Bougainville, Kupei Gold Field, in silvis 950 m. alt., arbor communis –10 m. alt.; *typus,* herb. Br. Mus.).

A var. *leptodictya* lamina anguste elliptica, basi symmetrica subcordata, receptaculo minori, cellulis scleroticis deficentibus differt. Ad *F. leptocladam* Benth. (Queensland) approximans.

F. irisana Elmer var. **validicaudata** (Merr.) Corner comb. nov.—*F. guyeri* Elmer v. *validicaudata* (Merr.) Sata, Monogr. (1944) 290.—? v. *minimaefolia* Sata id.—*F. fastigiata* Elmer, leafl. Philip. Bot. 1 (1906, April 10) 44.—*F. validicaudata* Merr. Philip. J. Sci. 1 (1906, April 15) Suppl. 45.—This is a dwarf state of *F. irisana* with small leaves and figs, occurring on high mountains and exposed places: it may well be phenotypic. The red tepals and lack of internal bristles show that it does not belong with *F. guyeri* Elm.

Clemens 17386; Bur. Sci. 2571, 12644, 27032, 37487, 38099, 42157; Elmer 6072, 8001 (*F. fastigiata*, typus), 8555, 8577, 8710, 14284, 21944, 21999; For. Bur. 936, 5084, 18140, 20125; PNH 1879, 7692; Vanoverbergh 1033; Whitford 1201 (*F. validicaudata*, typus).

F. tenuicuspidata Corner sp. nov.—Arbor tenuiramosa, foliis brevipetiolatis distichis, glabra, praeter receptacula non scabrida. Ramuli 1–1.5 mm. crassi, brunnei. Stipulae –8 mm. longae, binatae, caducae. Lamina 7.5–11 × 2–3.5 cm., elliptica, apice valde caudato-acuminata 25–38 mm. longo, (1/3–½ laminae efficienti) basi cuneata, integra, laevis, sicco griseo-viridis: costis lateralibus utrinsecus 6–8, intercostis –3, subtus leviter elevatis:

costis basalibus utrinsecus 1, brevibus, glandulis basalibus 2: petiolo 1.5–4 mm. longo. Receptacula axillaria, ? solitaria, scabridula: pedunculo 2–3 mm. longo: bracteis basalibus ternatis, 0.5 mm. longis: pedicello 2–3 mm. longo: corpore receptaculi 8–11 mm. lato, bracteis lateralibus nullis, ostiolo parum depresso: setis internis copiosis minutis: cellulis scleroticis copiosis. Flores feminei sessiles v. pedicellis rubris, glabris v. hispidulis, –1 mm. longis praediti: tepalis 4–5 fusco-rubris liberis hispidulis: ovario sessili rubro, lateribus pallidis: stylo glabro. Semina 1 mm. longa, lentiformia subcarinata, laevia. Cystolitha amphigena, papillata.

v. *tenuicuspidata*.—Celebes.

Boschpr. st. Cel 1/21, Bonthain; Bünnemeyer 12641, Bonthain, 1400 m. alt.; Elbert 2730, Buton Isl.; Eyma 1013, subdiv. Enrekang pr. Latimodjong (*typus*, herb. Leiden).

F. virgatae Reinw. simillima sed bracteis basalibus ternatis, seminibus lentiformibus, cystolithis papillatis, rectius prope *F. tonsam* Miq. et *F. irisanam* Elmer referenda.

v. **major** Corner var. nov.—Lamina –22 × 8 cm., apice 25–35 mm. longo, intercostis 4–7. Receptacula axillaria, solitaria v. fasciculato-ramiflora, glabra, majora, 12–15 mm. lata: pedunculo longiori 10–17 mm.; pedicello nullo. Tepala 3–4 glabra. Flores masculi sessiles v. rubro-pedicellati: stamine 1, haud mucronato, ad basim setulis circumdato, pistillodio nullo. Flores cecidiophori sessiles v. pedicellis glabris rubris –2.5 mm. longis praediti: ovario sessili albido. Flores feminei sessiles v. breviter pedicellati: ovario albido: stylo glabro rubro. Semina 1 mm. longa, lentiformia, subcarinata, laevia. Mindanao (Bukidnon province, Mahilucot River; Bur. Sci. 38635, *typus*, herb. Leiden; 38683).

F. cumingii Miq. v. *worcesteri* (Merr.) Corner similis sed tepalis rubris rectius inter *F. irisanam* et *F. tonsam* ascribenda.

F. elmeri Merr. Govt. Lab. Publ. Philip. 29 (1905) 9.—*F. semicordata* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 226, 293 (haud J. E. Smith).—This synonym must be re-instated as the correct name for *F. semicordata* Miq. in view of the oversight of *F. semicordata* B. Ham ex J. E. Sm. (= *F. cunia* B. Ham. ex Roxb.).

F. oleracea Corner sp. nov.—Arbor –20 m. alta, foliis distichis, glabra v. ramulis petiolisque pilis erectis pallidis mollibus, 2–3 mm. longis, laxe pubescentibus. Ramuli 3–5 mm. crassi, brunneoli. Stipulae 6–15 mm. longae, binatae, lanceolatae, glabrae, novellis subpersistentes. Lamina 16–35 × 5–12 cm. (–47 ×

15 cm., juvenilis), oblonga v. ovato-oblonga, apice breviter acuminata 10–20 mm. longo, basi plus minus valde cordata, symmetrica v. asymmetrica, uno latere late lobata et petiolum obtegenti, integra, coriacea, laevis v. subtus subscabrida, sicco griseo-viridis v. brunnea: costis lateralibus utrinsecus (7–) 9–12, (–16, foliis juvenilibus), divaricatis, intercostis 5–10, subtus leviter elevatis: costis basalibus utrinsecus 3–4, brevibus, glandulis basalibus 2: petiolo 5–12 × 2–4 mm., brevi, crasso. Receptacula axillaria, ramiflora et cauliflora, ad truncum in cumulis grandibus evoluta, maturitate e cremeo rubescentia: pedunculo 3–10 mm. longo: bracteis basalibus in collare ternatis, 1 mm. longis: pedicello 0–8 mm. longo: corpore receptaculi 15–32 mm. lato (25–48 mm., vivo), subgloboso, bracteis lateralibus nullis, ostiolo 2–4 mm. lato bracteis apicalibus 3–4 vix projicientibus occluso: setis internis –0.6 mm. longis, albidis, copiosis: pariete 1–2 mm. crasso, cellulis scleroticis nullis. Tepala 4–6, rubro-carnea dein pallida, libera, glabra v. puberula, lineari-oblonga, ovarium superantia. Flores masculi ostiolares, ordinibus 1–2 instructi, pedicellati: stamine 1, pistillodio nullo. Flores feminei et cecidiophori sessiles v. pedicellis glabris albidis –4.5 mm. longis praediti: ovario sessili, pallido: stylo femineo valde laterali, glabro v. puberulo, stigmate simplici. Semina 1.2 mm. longa, lentiformia, vix carinata, minute reticulata. Cystolitha amphigena. Solomon Islands.

var. **oleracea.**—Kajewski 1721 (*typus*, herb. Kew), 1912, Bougainville, Kupei Gold Field et Buin; J. H. L. Waterhouse 133 (New Georgia), 124, B203, 779 (Bougainville, Siwai), 203, 847 (Bougainville, Maisua); ? R. B. Comins 174 (San Cristoval).

var. **pugnans** Corner v. nov.—Ramuli, petioli, costa (subtus), et receptacula pilis erectis pallidis, flavidis v. brunneolis, 0.5 mm. longis villosuli, ad nervulos brevioribus. Lamina supra scaberrima, subtus villosula. Kajewski 1941, Bougainville, Buin, Kugumaru (*typus*, herb. Kew).

Species *F. fiskei* Elm. revocans sed arbor altior, receptaculis majoribus, setis internis praeditis, costis curvato-ascendentibus, intercostis numerosis. *F. tonsae* Miq. et *F. elmeri* Merr. affinis sed foliis majoribus brevipetiolatis, receptaculis majoribus, habitu cauliflori spectabilis.

F. chrysochaete Corner sp. nov.—Arbor mediocris –10 m. alta, v. suffruticosa, ramis horizontalibus, foliis distichis et ad ramulos flabelliforme dispositis. Ramuli et petioli pilis albidis, aureis, v. brunneolis mollibus erectis, 1–2 mm. longis, villosi: costae

subtus sparsim et breviter puberulae, nervuli glabri v. scabriduli: lamina supra sparsim et appresse pilosa, glabrescens, costis subvillosis. Ramuli 1–2 mm. crassi, brunneoli, saepe alternis anfracti. Stipulae –12 mm. longae, binatae, novellis subpersistentibus, albido-pilosae. Lamina 11–25 × 3–8 cm., anguste oblongo-elliptica v. subovata, apice acuminata 7–20 mm. longo, basi leniter cordata symmetrica v. subasymmetrica, latere acroscopico latiori, denticulata v. integra, chartaceo-subcoriacea, supra nitida et scaberrima, subtus hispidulo-velutinosa, sicco griseo-viridis v. olivacea: costis lateralibus utrinsecus 6–9 (–10), obliquis, intercostis 5–14, subtus elevatis: costis basalibus utrinsecus 3–4, ad ¼–½ laminae elongatis, glandulis basalibus 2: petiolo 5–10 × 1.5–2 mm. brevi. Receptacula axillaria, solitaria, pilis erectis 0.5 mm. longis hispidula, glabrescentia, scabridula, maturitate rubra: pedunculo 5–10 mm. longo, gracili: bracteis basalibus in collare ternatis, 1–1.5 mm. longis, ovato-acutis, appresse puberulis: pedicello 0–7 mm. longo: corpore receptaculi 8–10 mm. lato (12–15 mm., vivo), subgloboso, bracteis lateralibus nullis, ostiolo bracteis apicalibus parvis numerosis occluso: setis internis –1 mm. longis, albidis v. aureis, copiosis: cellulis scleroticis nullis. Tepala 5–6 albida libera, spathulato-oblonga, ovarium superantia, appresse hispidissima, stamine et ovario setulis circumdatis. Flores masculi ostiolares, ordinibus duobus instructi, sessiles v. pedicellati: stamine 1 (–2), pistillodio nullo. Flores feminei et cecidiophori sessiles vel pedicellis glabris –2 mm. longis praediti: ovario sessili, albido: stylo femineo puberulo. Semina 0.8 mm. longa, lentiformia, subcarinata, tenuiter reticulata. Cystolitha amphigena: pili laeves. Solomon Islands.

L. J. Brass 2960 (Ulawa), 3199 (Ysabel, Maringe, *typus* herb. Kew); Kajewski 1983, 2148 (Bougainville, Buin, Koniguru et Kugumaru), 2317 (Malaita); J. H. L. Waterhouse 201 (New Georgia), 232, 232a (Bougainville, Siwai).

Species lamina oblonga brevipetiolata, costis obliquis, intercostis numerosis strictis, aureopilosa facile distinguenda, inter *F. melinocarpam* Bl. et *F. fulvopilosam* Summerh. sed habitu humili frondoso-flabelliformi dissimilis.—*F. imbricatae* Corner comparanda.

F. imbricata Corner sp. nov.—Arbor –20 m. alta, ramulis divaricatis, foliis distichis. Ramuli, petioli, et costae (subtus) pilis erectis albidis v. flavidis 1–2 mm. longis plus minus villosi, nervuli subtus sparsim et breviter pilosi v. subglabri: lamina supra sparsim et breviter pilosa, glabrescens. Ramuli 1–2 mm. crassi,

brunneoli. Stipulae –10 mm. longae, binatae, lanceolatae, sparsim pilosae, caducae. Lamina 10–18 × 3.5–7.7 cm., elliptica, inaequilateralis, apice acuminata –17 mm. longo, basi rotundata v. late cuneata et asymmetrica, saepe latere acroscopico auriculato-lobulato, denticulata v. integra, supra scabrida, subtus scabrido-pilosa, rigide membranacea, sicco griseo-viridis: costis lateralibus utrinsecus 4–7, obliquis curvatis, –10 intercostis, subtus elevatis: costis basalibus 2 + 3, ad ¼–1/3 laminae elongatis, glandulis basalibus 2: petiolo 3–8 mm., brevi. Receptacula axillaria solitaria (? etiam ramiflora), pilis brunneolis rigidis –0.5 mm. longis hispidula, subglabrescentia: pedunculo 5–18 × 1 mm.: bracteis basalibus in collare ternatis, 1.5–2 mm. longis, lanceolatis: pedicello 4–15 mm. longo, gracili: corpore receptaculi 10–12 mm. lato (–25 mm., vivo, ficiformi, apice applanato), subgloboso, bracteis lateralibus nullis, apicem versus plus minus contracto, ostiolo bracteis apicalibus parvis numerosis subprojicientibus occluso: setis internis –0.5 mm. longis, albidis, sparsis: cellulis scleroticis nullis. Tepala 4–6 fusco-rubra, albescentia in receptaculis cecidiophoris, libera, lanceolato-oblonga, ovarium multo superantia, apicem versus hispidula. Flores masculi ostiolares, ordinibus 2–3 instructi, sessiles v. pedicellati: stamine 1, pistillodio nullo. Flores feminei et cecidiophori sessiles v. breviter pedicellati: ovario sessili, pallido: stylo glabro. Semina 0.7–0.8 mm. longa, lentiformia, subcarinata, subreticulata. Cystolitha hypogena: pili laeves. Solomon Islands (Bougainville).

Kajewski 1724, Kupoi village; J. H. L. Waterhouse B37 (Buka, Skotolan), 176, 818 (Siwai, *typus* 818 herb. Kew).

F. chrysochaete Corner affinis sed arbor major, receptaculo majori, setis internis paucis, tepalis rubris, laminae basi plus minus asymmetrico, costis lateralibus paucioribus. Auricula ad basim laminae acroscopica forsan ad plantas juveniles pertinens quod foliis in Kajewski 1724 (arbor alta) deficiens.

F. gryllus Corner sp. nov.—Arbor parva, foliis asymmetricis distichis. Ramuli, petioli, stipulae, receptacula, et costae (subtus) pilis albidis v. brunneis rigidis erectis 1–2 mm. longis hispido-scabridi: nervuli subtus pilis brevioribus: lamina supra pilis albidis erectis –1 mm. longis basi pustulato hispido-scabrida. Ramuli 5–6 mm. crassi, brunneoli, cavi. Stipulae 20–30 mm. longae, caducae. Lamina –35 × 16 cm., ovata, asymmetrica, apice acuminata 30–40 mm. longo, base valde asymmetrica, uno

latere late et profunde cordata, altero cuneato-subcordata, dentata, membranacea, utrimque scabrida, sicco griseo-viridis: costis lateralibus utrinsecus 7–8, intercostis –12, subtus elevatis: costis basalibus 2 +4, ad ½ laminae elongatis, glandulis basalibus 2: petiolo 10–40 × 3 mm., sub auricula laminae condito. Receptacula axillaria solitaria hispidissima, maturitate aurantiaca: pedunculo 4–6 × 2.5 mm.: bracteis basalibus in collare ternatis, 3–4 mm. longis, ovato-lanceolatis, acutis, hispidis: corpore receptaculi 15 × 12 mm. (pilis exclusis), ellipsoideo, bracteis lateralibus 2–4 mm. longis sparsis, circum ostiolum pluribus confertis erectis hispidis 2–3 mm. longis: setis internis albidis –1.5 mm. longis, copiosis: cellulis scleroticis nullis (receptaculo femineo). Flores feminei sessiles vel pedicellis glabris –1.5 mm. longis praediti: tepala 5–6 albida spathulata libera, apicem versus hispida: ovario sessili albido, setulis paucis circumdato: stylo sparsim puberulo. Semina 0.8–0.9 mm. longa, lentiformia v. breviter oblonga, subcarinata, laevia. Cystolitha hypogena: pili papillati. Solomon Islands (L. J. Brass 3407, Ysabel, Tiratona, in silvis c. 600 m. alt., *typus* herb. Kew).

Receptaculo horrido, lamina valde asymmetrica, species hispidissima facile distinguenda, *F. erinobotryae* Corner affinis.

F. erinobotrya Corner sp. nov.—Suffrutex v. arbor parva, foliis asymmetricis distichis. Ramuli, petioli, laminae, et receptacula pilis albidis v. brunneis erectis rigidis 1–2 mm. longis hispidi: nervuli subtus pilis brevioribus. Ramuli 2–3 mm. crassi, fusco-brunnei. Stipulae –12 mm. longae, pilosae caducae. Lamina 13 –32 × 5.5–14 cm., ovato-elliptica, apice acuminata –17 mm. longo, basi valde asymmetrica, uno latere cordata petiolum obtegenti, altero anguste subcuneato, denticulata v. subintegra, membranacea, supra scaberrima, subtus hispido-villosula, sicco griseo-viridis: costis lateralibus utrinsecus 7–11, inferioribus saepe glandulo axillari praeditis, –11 (–14) intercostis regulariter instructis, subtus elevatis: costis basalibus 3 + 5, ad 1/3–¼ laminae elongatis, glandulis basalibus 2. petiolo 7–10 mm. longo. Receptacula axillaria solitaria, dein cauliflora ad ramulos efoliatos –12 cm. longis paniculatos, basi 5–20 mm., apice 2–3 mm. crassos, internodis vix evolutis, hispidissima, maturitate rubra: pedicello 7–9 mm. longo, bracteis lateralibus 1–2 dispersis parvis, haud in collare confertis: corpore receptaculi 7–10 mm. lato, subgloboso, bracteis lateralibus 0–2, apicalibus numerosis parvis vix projicientibus: setis internis –1 mm. longis, albidis v. brunneolis, copiosis: cellulis scleroticis nullis. Tepala 5–7 (vel 3–5 in floribus masculis) subrubra v. albida, lanceolata

v. spathulata, libera, glabra v. apicem versus sparsim hispidula. Flores masculi ostiolares, ordinibus duobus instructi, sessiles v. breviter pedicellati, pedicellis hispidulis: stamine 1, pistillodio nullo. Flores feminei et cecidiophori sessiles v. pedicellis –1.3 mm. longis, hispidulis praediti: ovario sessili albido: stylo glabro v. subpuberulo. Semina 0.7–8 mm. longa, lentiformia, subcarinata, laevia. Cystolitha amphigena, supra saepe ut pili microscopici: pili laeves.

v. **erinobotrya.**—New Britain: G. Bateson 148, between Baining Mts. and Toma; Dept. Agr. T.N.G. A23, Malabunga Mission; NGF 3510, Galilo village (*typus*, herb. Lae); Warburg 20824, 20825, Ralum (ut *F. semicordata* Miq.); J. H. L. Waterhouse 268, Gazelle Peninsula.

Inter *F. elmeri* Merrill (= *F. semicordata* Miq.) et *F. fulvopilosam* Summerh., sed *F. gryllus* Corner affinis.

var. **solomonensis** Corner v. nov.—Pili ramulorum petiolorumque –1 mm. longi. Basis laminae minus cordatus, petiolum haud obtegens: costae laterales utrinsecus 5–8: petiolus 5–27 mm. Receptacula pedunculis 2–9 mm. longis, bracteis basalibus in collare ternatis, pedicellis 0–9 mm. longis praedita: corpore sine bracteis lateralibus. Tepala 4–5, florum pedicelli glabri. Cystolitha plerumque ut pili microscopici. Arbor –10 m, alta: ramulis 1–2 mm. crassis: lamina 6–26 × 3–13 cm., Solomon Islands.

L. J. Brass 3294, (Ysabel, Tasia), 3483 (Florida, Olevuga); Kajewski 2364, Malaita, (*typus*, herb. Kew); J. H. L. Waterhouse B99, B99a, 148, 794, (Bougainville, Siwai), 165 (New Georgia).

F. fulvopilosae Summerh. affinis et forsan subspecies sed foliis acute acuminatis, intercostis numerosis strictis, receptaculis minoribus, et habitu cauliflori dissimilis.

f. glabrior Corner f. nov.—Sparsim brunneo-hispidula vel glabra. Setae internae –0.5 mm. longae, copiosae. Cystolitha hypogena bene evoluta. Solomon Islands.

L. J. Brass 2557, San Cristoval, Waimamura: E. S. Brown 5054 (Guadalcanal, Aruligo), 5762, 5763 (Nggela, Soso; *typus* 5763, herb. Brit. Mus.), W/265 (San Cristoval, Aronopo); J. H. L. Waterhouse B260, B315 (Bougainville, Siwai).

F. storckii Seem. revocans sed lamina plus asymmetrica et acute acuminata, intercostis numerosis strictis, et cauliflora. *F. trachypison* Laut. et K. Schum var. *pallidae* Corner et *F. melinocarpae* Bl. var. *hololamprae* (Diels) Corner (species ? non cauliflora) comparanda.

F. opposita Miq. Hook. Lond. J. Bot. 7 (1848) 426.—*F. conjugata* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 222, 291.—*F. opposita* occurs in Australia and along the southern coast of New Guinea, extending to the Eastern Highlands in the Territory of New Guinea. *F. conjugata* was collected in Pulau Sangrang (Java), by Teysmann and de Vriese (type at Leiden), but has never been found thereabouts again. Nevertheless I can detect no difference from *F. opposita,* which is itself variable. The species of sect. Sycidium in Madagascar, however, are closest to the Australian alliance of *F. opposita* and this lone station of *F. conjugata* becomes significant.

var. **micracantha** (Miq.) Corner comb. nov.—*F. aculeata* Miq. var. *micracantha* (Miq.) Benth. Fl. Austral. 6 (1873) 175.—*F. aculeata* A. Cunn. ex Miq. Hook. Lond. J. Bot. 7 (1848) 426.—*F. orbicularis* A. Cunn. ex Miq. id.—*F. micracantha* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 221, 291.—That this is merely a small-leafed variety with aculeate hairs and slightly smaller figs is shown by intermediate collections, particularly from New Guinea.

var. **indecora** (A. Cunn. ex Miq.) Corner comb. nov.—*F. indecora* A. Cunn. ex Miq. Hook Lond. J. Bot 7 (1848) 426.—This has been confused with *F. orbicularis* (v. *micracantha,* above), but is distinguished by the foveolate areolae (stomatal pits) on the underside of the lamina and by the lack of the aculeate hairs. The few collections indicate that it is restricted to Western Australia, where it is close to *F. scobina* Benth.

Broadbent 774a, Yarru, Grey Creek; A. Cunningham 65 and 306 (1820), Careening Bay (*type*); Gardner 66, E. Kimberley, Moogerooga Creek; F. v. Mueller s.n., Victoria River (1855); Ostenfeld 1176, 1177, Derby; Perry 2578, pr. Carlton Station; Schultz 407, Port Darwin.

F. scobina Benth. Fl. Austral. 6 (1873) 176.—I take Schultz 410 as the type (lectotype) because Cunningham 124, also cited by Bentham, is *F. opposita* Miq. v. *micracantha* (Miq.) Corner. *F. scobina* is very near to *F. cumingii* Miq. of the Philippines, extending to New Guinea as v. *androbrota* (Summerh.) Corner, so that it may be an Australian variety, but the collections are too few.

Schultz 160, 410, 499, Port Darwin; Schomburgk, s.n. Port Darwin; Specht 873, Arnhem Land, Yirrkala.

F. fraseri Miq. Hook. Lond. J. Bot. 7 (1848) 235.—*F. proteus* Bur. Ann. Sc. Nat. ser 5, 14 (1872) 250.—*F. stenocarpa* F.v. Muell. ex Benth. Fl. Austral. 6 (1873) 174.—This has been confused with *F. fraseri* (Miq.) Miq., based on *Urostigma fraseri*

Miq., and which is a synonym of *F. virens* Ait. The type of *F. fraseri* Miq. (Fraser 154, Brisbane River) shows that it is identical with the well-known *F. proteus*.

F. coronata Spin. Cat. H. St. Sebast. (1818) 29; Roehm. et Schult. Mant. 1 (1822) 327; Mant. 3, add. 2 (1827) 403.—*F. muntia* Link, En. Pl. 2 (1822) 450.—*F. stephanocarpa* Warb. Fedde's Rep. 1 (1905) 75.—*F. aspera* hort. et *F. scabra* hort., non verae.—I have examined the type of *F. coronata* Spin., which is well-preserved in the Turin-herbarium, and it is exactly the species known as *F. stephanocarpa* Warb.; indeed, the description is unmistakable, as is that, also, of *F. muntia*. It appears to have been one of the early species introduced to cultivation in European hot-houses.

F. aspera Forst. f. Prodr. Fl. Austral. (1786) 76, n. 404.—*F. parcelli* Veitch ex Cogn. et Marchal, Pl. Ornem. 2 (1874) t. 47.—*F. parcelli* is merely the variegated state of *F. aspera*, but there are few collections of this species, and none that is good. Indeed, it is difficult to know how it differs from *F. scabra* Forst. f., except in the larger villous figs and the more copious veining.

F. storckii Seem. var. **kajewskii** (Summerh.) Corner comb. nov.—*F. kajewskii* Summerh. J. Arn. Arb. 13 (1932) 103; Bull. B. Bish. Mus. 141 (1936) 53.—A character of *F. storkii* is the presence of abundant cystoliths on both sides of the lamina, and this is the surest distinction, in the herbarium, from glabrous forms of *F. scabra*, which has cystoliths only on the underside, Amphigenous cystoliths also distinguish *F. kajewskii*, which differs from *F. storkii* merely in the smaller leaves and figs. Thus, it may be the state of *F. storckii* in exposed situations, or it may represent twigs of old trees (10–15 m. high) with reduced size of leaf and fig; several more or less intermediate collections come from Fiji. However, var. *kajewskii* strongly resembles the widespread *F. ampelas* Burm. f. which differs mainly in the narrower and more asymmetric leaf-base, the basal bracts not ternate but scattered on the fig-stalk, and the presence of sclerotic cells in the fig-wall. I consider that they are parallel reductions. Malaysian and Polynesian, of the *F. melinocarpa* -stock.

New Hebrides.—Aubert de la Rue s.n. (Aug. 1937); E. S. Brown s.n., Espirito Santo; Kajewski 216, 233, 343, 737 (*typus*).

Fiji.—Parham 316; Degener 14517; A. C. Smith 460, 532, 1323, 5272, 6071, 6606, 7738, 8403.

subsect. Varinga (Miq.) Corner, ser. Cyrtophylleae Corner

F. asperiuscula Kunth et Bouché, Ind. Sem. Hort. Berol. (1846) 21; Ann. Sci. Nat. ser. 3, 7 (1847) 253; Miq. Fl. Ind. Bat. 1, 2 (1859) 300; Ann. Mus. Bot. Lugd. Bat. 3 (1867) 292.—*F. coronata* Reinw. ex Bl. Bijdr. (1825) 470 (non Spin.).—*F. grewiaefolia* Kunth et Bouché id. (non Bl.)—*Covellia zollingeriana* Miq. Hook. Lond. J. Bot. 7 (1848) 460.—*F. leptorhyncha* Koord. et Val. Bijdr. Booms Java 11 (1906) 156.—*F. inaequilatera* Ridl. J. Str. Br. R. As. Soc. 1 (1923) 93.—I have not found the type of *F. asperiuscula* but there are several collections from Java at Leiden, identified as *F. coronata* Reinw., on which Miquel has written "*F. asperiuscula* Kth. et Bouche". As this species agrees with the description, I take Miquel's authority for the interpretation of *F. asperiuscula*. It occurs only in Sumatra and Java, the Malayan records being *F. obscura* Bl., which has been much confused with it. A diagnostic character is the hooked apex of nearly all the hairs.

F. cyrtophylla Wall. ex Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 282, 296.—*Covellia cyrtophylla* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 460.—*F. asymmetrica* Lévl. et Vant. Fedde's Rep. 4 (1907) 82.—This species was erroneously reduced to *F. obscura* Bl. by King. It is a species of northern India, upper Burma, Tonkin, and South China, allied with *F. praetermissa* Corner and with the East African species centred about *F. stortophylla* Warb. It parallels in a remarkable way *F. fulvopilosa* Summerh. of Fiji.

India (Assam, Bhutan, Khasia, Sikkim).—T. Anderson 222; C. B. Clarke 11961, 13571, 25411, 25508; Cooper and Bulley 1060; Gamble 1152a, 9654; Griffith 4643; Hooker s.n., Khasia and Sikkim; King 2370, 5066, 5132; N.E. Parry 784; Thomson s.n. Sikkim; Wallich 4532 (*typus*).

Burma.—E. M. Buchanan 18, Myitkyina; Kingdon Ward 171 (Ngawchang Valley, Htawgaw), 9112 and 12932 (Nam Tamai valley), 20576 (Sumpra Bum); J. H. Lace 5345, Kadu; S. Toppin 4085, Kachin.

China (Kweichow, Yunnan).—Bodinier 2577; Cavalerie 2716, 3596, 3598; Esquirol 2692, 3108, 3549, 5238; Forrest 9419, 11535, 27975; Henry 11462, 12180; T. T. Yu 17386, 17465, 20488.

Tonkin.—Balansa 747, 2943; Poilane 25473, 25492, 25960.

F. leptogramma Corner sp. nov.—Arbor –7 m. alta, glabra, foliis brevipetiolatis distichis. Ramuli 2–3 mm. crassi, pallide griseo-brunnei, sicco sulcato-striati, vetustiores frustis corticis elongatis

angustis vestiti. Stipulae –15 mm. longae, binatae, subpersistentes, striatae. Lamina 10–35 × 2.7–14 cm., elliptica v. subovata, apice caudata –60 mm. longo, basi rotundata v. cuneata, breviter dentato-repanda, utrimque subscabrida, membranacea, sicco supra grisea, subtus brunneola; costis lateralibus utrinsecus 8–12, saepe glandula axillari praeditis, intercostis strictis –12, subtus leviter elevatis; costis basalibus utrinsecus 1–2, brevibus, glandulis basalibus 2: petiolo 3–12 (–20) mm. longo, sicco striato. Receptacula in cumulis –12 cm. latis ad ramos breves efoliatos congestos cauliflora: pedicellis 17–25 × 2–2.5 mm., bracteis lateralibus 1–3, 1–2 mm. longis, dispersis; corpore recptaculi 10–15 × 10–12 mm. (16–20 × 15–17 mm., vivo), subellipsoideo, lenticellis asperato, bracteis lateralibus numerosis 2–3 mm. longis et latis, dispersis, apicem receptaculi versus confertis, ostiolo bracteis apicalibus planis parvis occluso: setis internis et cellulis scleroticis nullis. Tepala albida, libera v. leviter connata, glabra, anguste oblonga v. subspathulata, ovario equalia. Flores masculi 2–3.5 mm. alti, ostiolares, ordinibus 2–3 instructi, sessiles v. subpedicellati: tepala 3–4: stamine 1 (–2), submucronato, pistillodio nullo v. raro evoluto. Flores cecidiophori 2.5–6.5 mm. alti, sessiles v. pedicellis glabris –3.5 mm. longi praediti;: tepala 5–6: ovario sessili v. substipitato, albido. Flores feminei similes sed pedicellis –2.5 mm., tepalis 5–8, ovario ad 1.5 mm. stipitato, stylo glabro, stigmate clavato. Semina 1 mm. longa, lentiformia, subcompressa, laevia, haud carinata. Cystolitha amphigena, supra sparsa. North Borneo, Sarawak, in silvis.

Kinabalu.—Sing. F.n. 26754 (Menetendok River, 1,000 m. alt.), 27328 (Koung, 500 m, alt,; *typus*, herb. Singapore). Sarawak.—Corner s.n. (1959), Kuching, Bt. Kuap.

F. praetermissae Corner affinis sed inter alia cauliflora, receptaculis majoribus. Ramulis stipulis petiolisque siccis striatis facile recognoscenda.

F. praetermissa Corner sp. nov.—Gagnep. Fl. Gen. I–.C. 5 (1928) 812 (ut *F. rostrata* Lam.).—Frutex, ? sarmentosus, v. arbor –6 m. alta, minute scabrido-puberula v. subglabra, foliis brevipetiolatis distichis. Ramuli 1.5–3 mm. crassi, brunnei. Stipulae parvae caducae. Lamina 7–25 × 3.5–9.5 cm., elliptica v. anguste obovata, apice caudata 12–35 mm. longo, basi cuneata et subasymmetrica, dentato-repanda v. denticulata, membranacea, scabrida, sicco pallide brunnea: costis lateralibus utrinsecus 5–8 (–9), obliquis, intercostis strictis 3–7, subtus leviter

elevatis: costis basalibus utrinsecus 1, brevibus v. ad 1/3 laminae elongatis, glandulis basalibus 1–2 v. nullis: petiolo 2–15 mm. longo. Receptacula axillaria, maturitate rubra dein nigra: pedicellis 2–5 mm. longis, bracteis lateralibus 1–2 parvis dispersis: corpore receptaculi 6–10 mm. lato, bracteis lateralibus 0–2 dispersis, ostiolo plano v. leviter depresso bracteis apicalibus parvis occluso: setis internis et cellulis scleroticis nullis. Tepala 3–5 albida glabra libera, anguste oblonga, ovario longiora. Flores masculi ostiolares, ordinibus 2–3 instructi: stamine 1, pistillodio nullo v. parvo. Flores feminei et cecidiophori subsessiles: ovario sessili albido: stylo glabro v. sparsim puberulo. Semina sublenticularia v. breviter oblonga, vix carinata, laevia. Cystolitha amphigena copiosa. Tonkin, Laos, Thailand.

Tonkin.—Balansa 2970 (Mt. Bavi, *typus,* herb. Paris), 4457 (Moe Ha; subsarmentosa). Laos.—Poilane 1904 (prov. Sau Nena, Muong Pun), 26434 (Haut Laos, inter Tafu et Bettown-Sai); Spire 199 (Bai Som Pho); Thorel (Bang Mue, pr. Lakon). Thailand.—Kostermans 771 (prov. Kolug chada, Rau ti River valley); Winit 1763 (Nau, Nam Ken).

Species insignis praetermissa. A *F. sinuata* Thunb. (*F. rostrata* Lam.) intercostis numerosis strictis, cystolithis amphigenis, bracteis corporis receptaculi lateralibus, pistillodio florum masculorum deficienti profunde differt, et speciebus africanis, ut *F. urceolari* Welw. ex Hiern, vero affinis.

subsect. Palaeomorphe (King) Corner ser. Pallidae Miq.

F. tinctoria Forst. f. Prodr. Fl. Austral. (1786) 76.—I distinguish four subspecies, three of which fill large geographical regions but with intermixture or overlapping at the boundaries. There is no specific difference in fig, flower, seed, or leaf, and it is possible to arrange specimens to form a continuous series. *F. tinctoria* and *F. virens* Ait. (subgen. *Urostigma*) are the most widespread species of *Ficus* and both are epiphytic stranglers, but this subsect. *Palaeomorphe* does not extend to Africa, as does sect. *Urostigma* to which *F. virens* belongs.

subsp. **tinctoria.**—Arbor, saepe epiphytica et suffocans. Lamina 4–13 cm. lata, obtusa, subacuta, v. subacuminata, oblonga, elliptica v. ovato-elliptica, nec dentata nec angulata, basi subcordata, rotundata, v. late cuneata, laevis v. subscabrida, subtus brunneo-areolata: stomata immersa. Receptacula pedicellata. Hainan, Formosa, Philippines (incl. Palawan), Celebes,

Sumbawa, Moluccas, Alor, New Guinea, North Australia, Micronesia, Polynesia to Tahiti and Austral Isl.

This is the insular state of the species as opposed to the continental.

subsp. **swinhoei** (King) Corner comb. nov.—*F. swinhoei* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 81, p. 101 C.—*F. fenicis* Merr. Philip. J. Sci. 18 (1921) 66.—Subscandens ad saxa scopulosque, scaberrima, hispidula. Lamina –10 × 6 cm., minor, elliptica, obtusa v. acuta, subsymmetrica, basi subcordata v. late cuneata, rigide coriacea, subtus haud brunneo-areolata: stomata immersa. Receptacula 8 mm. lata: pedunculo brevi, –1.5 mm. longo, bracteis basalibus ternatis: pedicello 2–4 mm. longo. Formosa, Mindanao.

subsp. **gibbosa** (Bl.) Corner comb. nov.—*F. reticulata* Thunb. Diss. Ficus (1786) 6, 12.—*F. gibbosa* Bl. Bijdr. (1825) 466.—Arbor epiphytica suffocans, etiam littoralis ad saxa repens. Lamina 4–13 × 2.5–6 cm., anguste elliptica v. lanceolata saepe plus minus obovata, saepe subrhomboidalis, angulata v. utrimque 1–2 angulato-dentata, apice acuta v. valde acuminata, basi cuneata, coriacea, haud v. vix scabrida, subtus brunneo-areolata. Receptacula 7–12 mm. lata.

var. **gibbosa.**—Lamina flexibilis, stomatibus immersis. Receptacula pedicellata. South Andaman Isl., south China, Hainan, Indochina, Thailand, Malaya, Sumatra, Java, Borneo, Palawan, Celebes, Soembawa, Banda, Halmaheira.

var. **rigida** (Miq.) Corner comb. nov.—*F. rigida* Bl. Bijdr. (1825) 465, (haud Jack).—*F. pereng* Steud. Nomencl. ed. 2 (1840) 637.—*F. gibbosa* Bl. var. *rigida* Miq. Ann. Mus. Bot. Lugd. Bat 3 (1867) 276.—var. *rigida* (Bl.) Val. Bijdr. Booms. Java 11 (1906) 171:—Lamina rigide coriacea, acute acuminata: stomatibus haud immersis. Receptacula sessilia v. breviter pedicellata: bracteis basalibus ternatis, 1–2 mm. longis. Sumatra, Java, Soembawa, Alor, South Borneo.

This is the state of the species in South East Asia and Western Malaysia, but it intergrades with ssp. *tinctoria* in Celebes, Halmaheira, and Palawan, and with ssp. *parasitica* in Hainan, south China, Indochina, and the Andaman Islands. How the species is to be classified in these boundary-regions will be a problem for local botanists to investigate.

subsp. **parasitica** (Willd.) Corner comb. nov.—*F. parasitica* Willd. Mem. Acad. R. Sc. Bell. Lett. Fr. Guill. 2 (1798) 102, t. 3.—*F. gibbosa* Bl. var. *parasitica* (Willd.) King, Ann. R. Bot. Gard. Calc. 1 (1887) 6, pl. 2 a–b.—Lamina ut in ssp. *gibbosa* sed saepius

subrhomboidalis et angulata, tenuiuscule coriacea, scabrida v. laevis, saepe subtus puberula v. subvillosa, haud brunneo-areolata: stomatibus haud immersis. Receptacula pedicellata.

var. **parasitica.**—Arbor epiphytica suffocans. Receptacula 7–11 mm. lata. Ceylon, India, Burma, south China, Indochina, Andaman Islands, Nicobar Islands.

var. **anastomosans** (Wall. ex Kurz) Corner comb. nov.—*F. anastomosans* Wall. ex Kurz, For. Fl. Br. Burma 2 (1877) 455. —Frutex v. ad rupes calcareos repens. Glabra v. ramulis foliis receptaculisque albido-puberulis. Lamina 3–9 × 1–5 cm., elliptica v. subrhomboidalis, dentata v. pinnato-lobata, subscabrida: petiolo –5 mm. longo. Receptacula 6–8 × 5–6 mm., pedicello –15 mm. longo. Burma, Thailand.

Lobb s.n. Moulmein; Wallich 4513, Kogun, *typus;* A.F.G. Kerr 282 (Prachuap), 2510 (Sam Roi Yawt), 5239 (Mé Poi, Ching Dao), 6089 (Mé Lamung, Kampeng Pet), 12854 (Wang Kanai, Kanburi).

Varietas inspicienda. Forsan forma juvenilis fertilis. Folia ut in *Streblus asper* Lour.

F. virgata Reinw. ex Bl. Bijdr. (1825) 454.—*F. decaisneana* Miq. Fl. Ind. Bat. 1, 2 (1859) 312.—*F. firmula* Miq. et *F. trymatocarpa* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 224, 292.—*F. pinkiana* F.v.M. in Wing's South Sci. Rec. 2 (1882) 273.—*F. esmeralda* Bailey, Queensl. Agr. J. 1 (1897) 452.—*F. inaequifolia* Elmer, Leafl. Philip. Bot. 1 (1907) 242.—As this species was named by Reinwardt and published by Blume, the type is Reinwardt 1376 (Banda Major, Moluccas) in the Leiden herbarium, where it is named by both authors. Blume, however, added Java as a locality. No Javanese specimen exists and the species, as defined on Reinwardt 1376, does not occur there. Possibly, as others have suggested, Blume mistook a specimen of *F. subulata* for Reinwardt's species, but that does not mean that it should be reduced to *F. subulata.* I have carefully studied Reinwardt 1376 and am sure from its amphigenous cystoliths that it is the wide-spread species known as *F. philippinensis* and *F. decaisneana.* It is closely allied with *F. tinctoria* and with *F. subulata,* and most specimens have been wrongly referred to these species.

var. **philippinensis** (Miq.) Corner comb. nov.—*F. philippinensis* Miq. et *F. insularis* Miq. Hook. Lond. J. Bot. 7 (1848) 435.—*F. magnifica* Elmer, Leafl. Philip. Bot. 1 (1906) 51.—*F. setibracteata* Elmer, Leafl. Philip. Bot. 7 (1914) 2411, 2413.—Receptacula interne et tepala rubra, pallescentia: setis internis copiosis; pedicellis florum saepe hispidulis. Philippines, Formosa, Ryu Kyu.

var. **sessilis** (Bur.) Corner comb. nov.—*F. philippinensis* Miq. var. *sessilis* Bur. Ann. Sci. Nat. ser. 5, 14 (1872) 253. Ut v. *virgata*, tepalis albidis, sed receptaculis plus minus sessilibus: bracteis basalibus 3–6, 1–3 mm. longis. Philippines, Moluccas, New Guinea, New Britain, Solomon Isl., New Caledonia, Loyalty Isl., New Hebrides.

F. celebensis Corner nom. nov.—*F. irregularis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 224, 292 (non Steud.).—This willow-like tree is now cultivated in several parts of the tropics and subtropics, but its identity is generally not known. Hence this inevitable name-change will not be serious: it will indicate the origin of the plant and how little is yet known of it in the wild state.

subsect. Palaeomorphe (King) Corner ser. Subulatae Corner

F. subulata Bl. var. **gracillima** (Diels) Corner comb. nov.—*F. gracillima* Diels, Engl. Bot. Jahrb. 67 (1935) 194.—? *F. otariophylla* Diels, id. 209.—Over its great range from the Himalayas to the Solomon Islands and New Hebrides, var. *subulata* is remarkably uniform. In New Guinea there occurs this state, var. *gracillima*, with small lanceolate, caudate-acuminate lamina (3–13 × 0.9–3 cm.) without intercostal veining, generally with one basal gland in the axil of one of the lower lateral nerves (not of a basal nerve), and with small figs 4–5 mm. wide (dried): further, the male flower lacks the gall-ovary. These plants are said to be slender epiphytes or scandent bushes in the mountains of New Guinea. Var. *subulata* is normally an epiphyte rooting to the ground, but not strangling, yet it, too, sends out slender creeping runners with reduced leaves and short adventitious roots whereby it attaches itself to other trunks. Several collections, also, from New Guinea bridge the difference in leaf-size. Therefore, though var. *gracillima* in the extreme looks a different species, it clearly grades into typical *F. subulata*. In the Himalayas *F. sikkimensis*, which I regard as synonymous with v. *subulata*, is a less reduced state, also lacking the gall-ovary in the male flower.

F. otariophylla, from New Guinea, has the short stipules and small figs of var. *gracillima*, but the figs are cauliflorous. Its main twigs bear large leaves (–30 × 9 cm., lamina) as in var. *subulata*, but the side-branches bear abruptly the small leaves of var. *gracillima*. Such a rapid change from large to small leaf on branching

occurs also in *F. virgata* Reinw. ex Bl. Hence, I suspect that *F. otariophylla* may be the sapling, or bathyphyllous, form of var. *gracillima*.

I refer the following to var. *gracillima:*

Brass 11391 (Neth. New Guinea, Bele River, 2,200 m. alt.), 13865 (Idenburg River, Bernhard Camp), 23280 (Milne Bay district, Mt. Dayman, 1,370 m. alt.); Carr 13261, 13353, 13449 (Boridi, 1,500 m. alt.), 15387 and 15430 (Isuarava, 1,500 m. alt.), 15980 (Lala River, 1,600 m. alt.); Clemens 5045 Morobe district, Ogeramnang, 5,900 ft. alt.); Docters v. Leeuwen 10121, 11110 (Rouffaer River); Ledermann 8174 (Sepik, *type*); Meyer-Drees 603 (Neth, New Guinea, Bernhard Biv.); NGF 6161 (Eastern Highlands pr. Goroka, 7,300 ft. alt.), 8477 (Morobe district, pr. Skindewai, 5,400 ft. alt.), 9433 and 9455 (Western Highlands, Mt. Hagen, 7,000 ft. alt.), 9565 (Eastern Highlands, 6,500 ft. alt.).

F. otariophylla Diels.—Ledermann 8572 (Sepik, *type*); Carr 15925, 16110a (Isuarava, 1,100 m. alt.).

subsect. Palaeomorphe (King) Corner ser. Cuspidatae Miq.

F. sinuata Thunb. Diss. Ficus (1786) 6, 12.—*F. rostrata* Lam. Encycl. 2 (1788) 498.—Examination of Thunberg's type (Uppsala), shows that it is *F. rostrata* Lam. (type, Paris). Thunberg ascribed it to Ceylon, where this species does not occur, and he must have made a mistake for Java, where it is common.

ssp. **sinuata** var. **oblonga** Corner nom. nov.—*F. cuspidata* Reinw. ex Bl. var. *sinuata* King, Ann. R. Bot. Gard. Calc. 1, 2 (1888) 89, pl. 112 C.—This differs from v. *sinuata* in the narrowly oblong lamina with more numerous lateral nerves at right angles to the midrib. With the change in specific epithet, so King's varietal name must be changed.

Malaya.—King's coll. 7256 (Perak); Sing. F.n. 21338, 29023, 32502 (Johore). Sumatra.—O. Hagerup s.n. (1916–17, Lake Toba), Yates 1414 (East Coast). Java.—Zollinger 1674.

ssp. **cuspidata** (Reinw. ex Bl.) Corner comb. nov.—*F. cuspidata* Reinw. ex Bl. Bijdr. (1825) 464 (incl. α and B).—I cannot separate this from the variable *F. sinuata* except as a montane subspecies with smaller, subsessile, fig and smaller, more or less lanceolate, leaf. Small-leafed states of ssp. *sinuata* v. *sinuata* seem to merge into ssp. *cuspidata*, but its greater resemblance is with v. *oblonga*.

F. heteropleura Bl. Bijdr. (1825) 466.—*F. urophylla* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 429.—*F. caudatifolia* Warb. Perk. Fragm. Fl. Philip. 3 (1905) 194.—*F. eucaudata* Elmer, Leafl. Philip. Bot. 1 (1906) 40.—*F. rostrata* Lam. var. *urophylla* (Wall.) Koord. et Val. Bijdr. Booms. Java 11 (1906) 175.—Blume's type at Leiden is well-preserved and accompanied by a fine painting, which leaves no doubt of its identity.

var. **hirta** Corner var. nov.—Ut v. *heteropleura* sed ramulis, petiolis, costisque (subtus) pilis albidis dein brunneis 0.5–1 mm. longis hispido-villosis. Receptacula minora 5–10 mm. lata, pedicello breviori –3 mm. longo. Sarawak.

J. A. R. Anderson 9147 (Lundu); Beccari s.n. et 780 (Kuching); Bur. Sci. Pl. Saraw. 1938 (*typus*, herb. Leiden); Kep. F.n. 80038 (B.6 For. Res.).

var. **mindanaensis** (Warb.) Corner comb. nov. *F. mindanaensis* Warb. Perk. Fragm. Fl. Philip. 3 (1905) 195.—This is distinguished by its larger leaf and fig, but there are several intermediate collections from the Philippines so that it is with difficulty separable.

subsect. Palaeomorphe (King) Corner ser. Minutuliflorae Sata

F. aurita Reinw. ex Bl. var. **auriculifera** (Merr.) Corner comb. nov.—*F. auriculifera* Merr. Univ. Calif. Publ. Bot. 15 (1929) 46.—Stipulae caducae. Lamina auricula basali minori –8 × 2 mm. praedita: costis lateralibus utrinsecus 4–7. Borneo, Celebes, Philippines, Amboina.

Borneo.—Clemens 10467, 26194, 26611, 30288 (Kinabalu); Elmer 20468 (Tawao, *type*); Endert 4667 (W. Koetai), Celebes. —Bloembergan 4106 (Menado, G. Ngila-laki); Kjellberg 2351 (Malili), NIFS Cel/V-284 (Malili, Kawata). Bohol.—Bur. Sci. 42744. Amboina.—Binnendyk 6820.

var. **celebica** (Reinw. ex Bl.) Corner comb. nov.—*F. celebica* Reinw. ex Bl. Bijdr. (1825) 461.—Stipulae persistentes. Lamina haud auriculata, basi cuneata: costis lateralibus utrinsecus 3–7. Celebes.

Reinwardt 1626, Kamanga, *type;* Koorders 19257, Menado; Riedel s.n., Gorontalo; Teysmann et de Vriese s.n., s.l.

subsect. Palaeomorphe (King) Corner ser. Fibrosifoliae Corner

F. obscura Bl. Bijdr. (1825) 474.—This common and variable species of Western Malaysia has been much confused through King's error in identifying with it *F. asperiuscula* Kunth et

Bouché and *F. cyrtophylla* Wall. ex Miq. In subordinating the swarm of unnecessary species created by Miquel, King mistook *F. obscura* and used *F. pisifera* Wall. ex Miq. in its place. Four sheets named by Blume at Leiden leave no doubt what he intended, and on this basis I have re-constructed. In recognising five varieties I realise that intermediates occur which will require investigation, but most of the five hundred collections which have now been made fall into these categories without much difficulty. They seem to have little geographical significance.

var. **obscura.**—Receptacula 9–12 mm. lata (12–20 mm., viva), plus minus brunneo-hispida v. villosa (ut ramuli). Lamina supra scabrida. Java, Sumatra, Borneo, Celebes, Philippines, Talaud.

The large-fruited, hairy, and scabrid state, not known from Malaya, except for one plant of doubtful origin in the Penang Waterfall Gardens.

var. **angustata** (Miq.) Corner comb. nov.—*F. hypsophila* Miq. var. *angustata* Miq. Pl. Jungh. (1851) 60.—Plus minus glabra, laevis v. vix scabrida. Lamina basi anguste cuneata, vix asymmetrica, saepe coriacea et bullata, denticulata v. integra, stipulis caducis. Receptacula 5–8 mm. lata. Java, Sumatra, Lingga, Borneo, Celebes, Moluccas (Soela).

F. uniglandulosae Wall. ex Miq. similis, sed nervis ut in *F. obscura* et tepalis albidis. Forsan species distincta. *F. uniglandulosa* nondum in Java inventa.

var. **borneensis** (Miq.) Corner comb. nov.—*F. microtus* Miq. var. *borneensis* Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 273.—*F. pisifera* Wall. ex Miq. Hook. Lond. J. Bot. 7 (1848) 427; King, Ann. R. Bot. Gard. Calc. 1 (1887) 3, pl. 1.—Ramuli et petioli brunneo-villosi glabrescentes. Lamina plus minus scabrida. Receptacula 5–8 mm. lata, scabrida, brunneo-puberula glabrescentia: pedicello 2–6 mm. longo. Lower Thailand, Malaya, Riouw, Sumatra, Java, Borneo, Celebes, Philippines.

The commonest variety, as a small-fruited state of v. *obscura*.

var. **kunstleri** (King) Corner comb. nov.—*F. celebica* Reinw. ex Bl. var. *kunstleri* King, Ann. R. Bot. Gard. Calc. 1 (1887) 12, pl. 10 A.—*F. acuminatissima* Miq. Hook. Lond. J. Bot. 7 (1848) 233.—*F. lancifolia* Miq. id. 452.—Ut. var. *scaberrima* sed lamina lanceolata acuminata. Malaya (Perak), Sumatra (Fort de Kock), Bangka, Borneo, Celebes, Philippines.

Forsan v. *scaberrima* statu vetuso sed in Java non inventa. King's coll. 3927 (Perak, *typus*) in errore sub *F. celebica* (*F. aurita* var. *celebica*) disposita.

var. **scaberrima** (Bl.) Miq. Ann. Mus. Bot. Lugd. Bat. 3 (1867) 273.—*F. scaberrima* Bl. Bijdr. (1825) 474.—Ut in v. *obscura* sed receptaculis 6–7 mm. latis, sessilibus v. breviter pedicellatis –2 mm., brunneo-setosis, tarde glabrescentibus. Sumatra, Java, Borneo, Celebes, Philippines.

F. midotis Corner sp. nov.—Frutex v. arbor –11 m. alta, saepe epipytica sed non suffocans, glabra, sparsim puberula, v. scabridula, foliis distichis. Ramuli 1–2.5 mm. crassi, brunnei dein lutescens. Stipulae –12 mm. longae, caducae. Lamina 11–33 × 3.5–13 cm., ovato-elliptica, oblonga, v. ad ramulos ultimos anguste elliptica, symmetrica, apice caudata 12–45 mm. longo, basi late v. anguste cuneata, symmetrica v. uno latere breviter decurrens et subauriculata, crenato-dentata v. integra, membranacea v. subcoriacea, utrimque subscabrida v. laevis, sicco brunnea: costis lateralibus utrinsecus (6–) 8–13, obliquis, saepe glandula axillari praeditis, intercostis 3–7, subtus leviter elevatis: costis basalibus utrinsecus 1–2, v. latere latiori –4, glandulis basalibus 1–2: petiolo 3–20 × 2–4 mm., Receptacula axillaria binata et ad ramos et truncum usque ad basim fasciculata, scabridula, maturitate e luteo rubescentia: pedicellis 3–25 mm. longis, brevioribus ad receptacula axillaria pertinentibus, bracteis lateralibus 1–2 minutis dispersis: corpore receptaculi 6–10 mm. lato (10–12 × 9–10 mm., vivo), raro bractea una laterali praedito, apice subumbonato, ostiolo haud v. vix depresso bracteis apicalibus parvis occluso: setis internis nullis, v. paucis minutis: cellulis scleroticis nullis. Tepala albida, oblonga, acuta v. obtusa, puberula v. apicem versus denticulata, ad basim leviter connata. Flores masculi ostiolares sessiles, ordine uno instructi: tepala 5–7: stamine 1, pistillodio bene evoluto. Flores feminei et cecidiophori sessiles: tepala 4–5: ovario sessili, vel cecidiophoro stipitato: stylo glabro. Semina 1.5 mm. longa, subcompressa, oblonga, apice carinata. Cystolitha hypogena: fibris sclereidiformibus in mesophyllo copiosis. Borneo in silvis planis et montanis –2,800 m. alt.

Br. North Borneo (in regionibus omnibus).—Amdjah 651 (det. *F. subulata*); Clemens (Kinabalu) 10366, 10469, 27017, 27685, 28667, 29650 bis, 30294, 30624, 36057, 31350, 31551, 31539, 32013, 32222, 32617, 33294, 33643, 33997, 40392, 40624; Elmer 21908; For. Dept. 1360, 1518, 1555, 7276, A 2936, A 3242, A 4714; Ramos 1441, 1478 (det. *F. pisifera*); Sing. F.n. 18987, 19061, 26324 (*typus,* herb. Singapore). 27331, 27380, 27854; D. Wood 1982 (det. *F. pisifera*). Koetai.—Endert 4774;

Kostermans 5563, 5626. S.E. Borneo.—v. Slooten 2132, Tanah boemboe, Batu Litjin (det. *F. pisifera*). Sarawak.—J. A. R. Anderson 8972; Beccari 843; Haviland 1612; Purseglove 4717.

F. obscurae Bl. affinis sed foliis quasi laevibus symmetricis plurinervis, stipulis caducis, receptaculis longipedicellatis, cystolithis hypogenis differt, et speciminibus jam numerosis certe distinguenda.

F. leptocalama Corner sp. nov.—Arbor –5 m. alta, glabra, foliis brevipetiolatis distichis. Ramuli 1 mm. crassi, graciles, pallide ochracei. Stipulae –8 mm. longae, plus minus persistentes, appressae. Lamina 8–15 × 2.5–4.5 cm., elliptica, subasymmetrica, apice caudata –30 mm. longo, basi cuneata uno latere minute auriculata, integra, membranacea, supra subscabrida, sicco griseo-viridis: costis lateralibus utrinsecus 7–10, intercostis –3, subtus leviter elevatis: costis basalibus utrinsecus 1, brevibus, glandulis basalibus 1–2: petiolo 1–2 mm. longo, brevissimo. Receptacula geocarpica ad ramulos graciles repentes efoliatos –1.8 m. longos, basi –10 mm. crassos, e basi trunco crescentes, binata, maturitate rubescentia: pedicello 1–2 mm. longo, bracteis lateralibus 2–3 minutis dispersis: corpore receptaculi 6–8 mm. lato, subgloboso, bracteis lateralibus 1–3 parvis dispersis, scabriusculo, ostiolo bracteis apicalibus parvis numerosis occluso: setis internis et cellulis scleroticis nullis. Tepala 4 albida oblongo-lanceolata glabra libera v. vix connata. Flores feminei sessiles v. breviter pedicellati: ovario sessili: stylo glabro. Semina 1.2 mm. longa, oblonga, laevia, subcompressa, haud carinata. Cystolitha hypogena: fibris sclereidiformibus in mesophyllo copiosis. North Borneo (Sing. F. n. 26829, Kinabalu, Menetendok River, Kuala Serab, 1000 m, alt.; *typus* herb. Singapore).

F. midotis Corner affinis sed gracilior, geocarpica, et seminibus haud carinatis.

F. rubrocuspidata Corner sp. nov.—Frutex v. arbuscula, saepe epiphytica, glabra, haud scabra, foliis brevipetiolatis distichis. Ramuli 1–1.5 mm. crassi, cremei v. pallide ochracei v. brunneoli. Stipulae –8 mm. longae, lanceolatae, caducae. Lamina 5–23 × 1.2–4.5 cm., elliptico-obovata v. lanceolato-elliptica, symmetrica, apice caudato-acuminata –45 mm. longo, basi cuneata, symmetrica, integra, membranacea, laevis, sicco griseo-viridis: costis lateralibus utrinsecus 5–10 (–14 in foliis juvenilibus), quasi rectangulatis, intercostis 0–1 (–2): costis basalibus utrinsecus 1, glandula basali 1: petiolo 2–6 mm. longo, gracili.

Receptacula axillaria binata, etiam ad ramulos defoliatos fasciculata, laevia, maturitate e luteo rubra: pedicello 0–1.5 mm. longo: corpore receptaculi 3–5 mm. lato, bracteis lateralibus nullis: setis internis et cellulis scleroticis nullis. Tepala 4 rubra, saepe aetate pallescentia, libera acuta glabra. Flores masculi ostiolares, ordine uno instructi: stamine 1, pistillodio nullo v. minuto. Flores feminei et cecidiophori sessiles: ovario sessili albido: stylo glabro. Semina 0.8 mm. longa, breviter oblonga, vix carinata, laevia. Cystolitha hypogena: fibris sclereidiformibus in mesophyllo copiosis. Borneo, in regionibus omnibus, in silvis –1,500 m. alt.

Amdjah 315; Brunei 5328; Clemens 20192, 25254, 26254, 26986, 30572, 30729, 30824, 31351, 31892, 40365, 40365 A; Endert 3066, 4677; For. Dept. B.N.B. 1808, 2977, 3117, A 4528, A 4647; Motley 1226; Purseglove 4671, 5470; Sing. F. n. 26339, 27323 (Kinabalu, Koung, 400 m, alt.; *typus* herb. Singapore).

F. microsphaerae Warb. (ins. philipp.) persimilis sed tepalis rubris, fibris sclereidiformibus in mesophyllo, costis quasi rectangulatis, lamina haud scabrida differt, etiam in insulis philippinensibus nondum inventa. *F. sinuata* Thunb. ssp. *cuspidata* (Reinw.) Corner similis et eisdem modis differt, etiam seminibus vix carinatis. Vero *F. uniglandulosae* Wall. ex Miq. affinis.

F. rubromidotis Corner sp. nov.—Frutex vel arbor parva, saepe epiphytica, glabra v. ramulis stipulisque puberulis, foliis brevipetiolatis distichis. Ramuli 2–3 mm. crassi, griseo-ochracei. Stipulae 10–20 mm. longae, late lanceolatae, binatae, scariosae, striatae, brunneolae, saepe ramulos investientes, persistentes. Lamina 15–36 × 5–12 cm. oblongo-elliptica, apice attenuato-acuminata v. caudata 12–50 mm. longo, basi rotundato-cuneata uno latere breviter auriculata, integra, rigidiuscule subcoriacea, laevis v. subtus subscabrida, subbullata, sicco fusco-olivacea: costis lateralibus utrinsecus (9–) 12–20, subtus valde elevatis, saepe glandula axillari praeditis, intercostis 6–10, subtus elevatis: costis basalibus utrinsecus 1, brevibus, glandulis basalibus 1–2: petiolo 1–10 × 3–4 mm., crasso, sub auricula plus minus condito. Receptacula axillaria binata et ad truncum ramosque fasciculata, maturitate e luteo rubra: pedicello 1–2 mm. longo vel receptaculo cauliflori 10–15 mm., gracili, bracteis lateralibus 2–3 minutis dispersis: corpore receptaculi 5–7 mm. lato, subgloboso, bracteis lateralibus nullis, ostiolo plano parvo: setis internis et cellulis scleroticis nullis. Tepala 4 rubra v. brunneorubra oblonga obtusa glabra libra. Flores masculi ostiolares

sessiles, ordine uno instructi: stamine 1, pistillodio bene evoluto. Flores cecidiophori sessiles v. pedicellati, feminei sessiles: ovario sessili albido: stylo glabro. Semina 1 × 0.5–0.6 mm., oblongo, subcarinata, laevia. Cystolitha hypogena, fibris sclereidiformibus in mesophyllo copiosis. Sarawak, Brunei, in silvis humidis, praesertim ripariis.

W. M. A. Brooke 9125 (Kuching); Brunei 5331, 5340 (Ulu Belalong); Clemens 20539 (Kuching, G. Tiang), 20699 (Bidi Cave Mountain; typus, herb. Kew), 22117 (Gat, Upper Rejang River).

Stipulis scariosis striatis persistentibus, costis numerosis valde distincta, *F. midotis* Corner affinis.

Posthumous Publication of New Dipterocarp Species from North Borneo

Footnote:—These notes are put together from material supplied by the Forest Department of North Borneo and the Forest Research Institute of the Federation of Malaya, and are now published to validate the new species, descriptions of which the authors had left in manuscript.

Editor.

1. **Dipterocarpus exalatus** van Slooten **sp.nov.** (§ Angulati).

A *D. kunstleri,* cui simillima, ramulis magis applanatis, internodiis virgularum glabris, foliis adultis angustioribus, fructibus validius angulatis, laciniis accrescentibus perbrevioribus vel carentibus haec species sat distincta.

Arbor elata circa 40 m. alta, cum trunco 90 cm. in diam. *Folia* chartacea vel coriacea, lanceolata, interdum elliptico- vel oblongo-lanceolata, apice abrupte caudato-acuminata, basin versus cuneata, margine crenato-sinuata, 12–22 cm. longa, 5.5–9 cm. lata, costis nervisque subtus minute lepidotis exceptis utrinque glabra, nervis lateralibus utrinsecus 15–20 praedita, petiolis 2–3 cm. longis stipitata. *Inflorescentia* in ramulis producta, axillaris vel apicalis, solitaria, ad 22 cm. usque longa, in ramulos sympodiales 4–8 floribus praeditos 1–3-plo divisa. *Flores* alternati, vel fere secundi; calyx infundibuliformis, coriaceus vel ligneus, in pedicellum 10–15 mm. longum attenuatus, prominenter 5-angulatus, apice in lobos duos majores ad 10 mm. usque longos et in tres alteros fere dimidios divisus; petala oblique spathulata, basi connata, in alabastro torta et extus minute stellato tomentosa. *Fructus* valde 5-angulatus, 4–5 cm. longus, 2.3–3.5 cm. in diam. glaber, cum laciniis 2 reductis vel interdum accrescentibus ad 12 cm. usque longis, ad 3 cm. usque latis, alteris 3 excrescentibus auriculatis. *Nux* ovoideus, 4 cm. longus, 2 cm. in diam., superne pubescens, in stylopodium exsertum, angulato-costatum, paullatim attenuatus.

BORNEO: Parte orientale indonesiana, apud Balikpapan (bb. 13,913, holotypus in BO). Parte septentrionale britanica, Sandakan, (SAN 1721, paratypi in SAN & BO).

This species is very like *D. kunstleri* but differs from that in more flattened twigs, glabrous internodes of the young shoots, narrower leaves, more prominently-angled fruits, much shorter accrescent lobes of the fruit.

[The name has been used before as a *nomen nudum*. The drawings with notes were prepared by Dr. van Slooten.]

Dipterocarpus exalatus v. Sl. (bb. 13,913, holotypus)

a, Ramulus floriferus. b, Alabastrum ante anthesin. c, Flos post anthesin. d, Ibid. apertus ut stamina ovariumque appareant. e, Calyx longitudinaliter dissectus ut ovarium appareat. f, Stamina.

Dipterocarpus exalatus v. Sl. (SAN 1721: paratypus)
a, Ramulus fructiferus. b, Fructus juvenilis cum calyce dissecto.

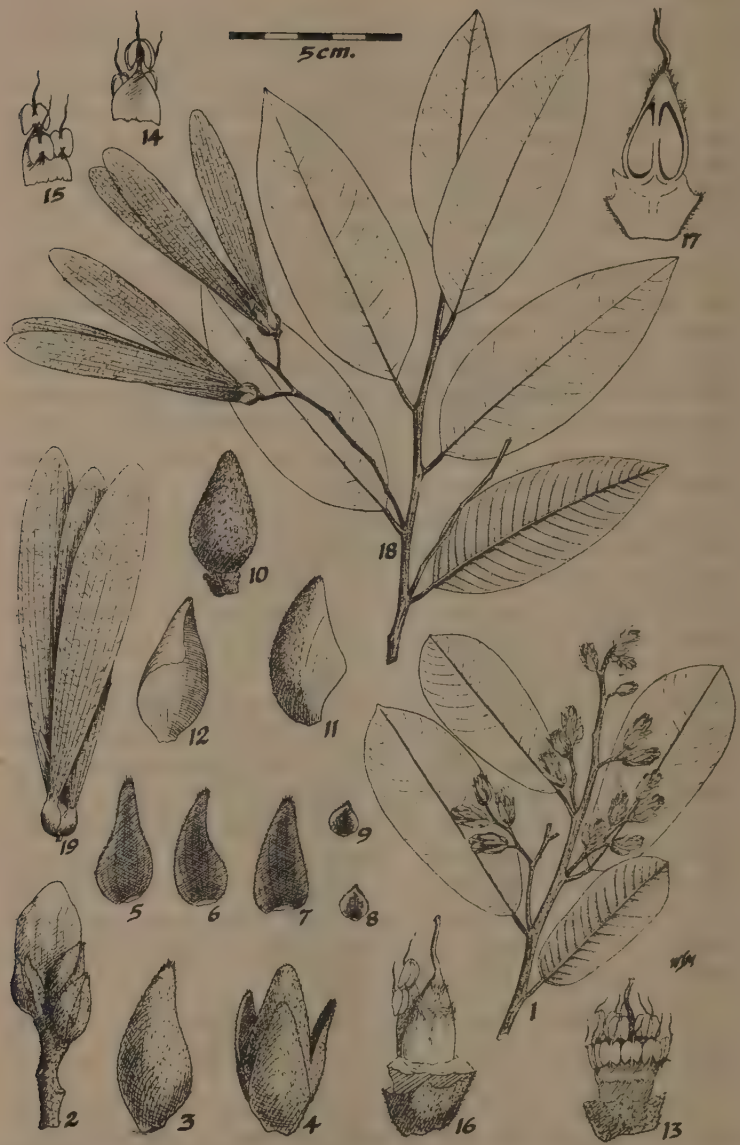
2. **Shorea argentifolia** Sym. **sp.nov.** (§ Grex "Red Meranti")

Ponenda inter species staminibus 15 biseriatim dispositis; antheris quadriloculatis ad anthesin interdum reflexis; appendiculis haud ciliatis, interdum reflexis in serie interiore quam anthera plerumque brevioribus. *S. leprosulae* Miq. similis, sed foliis minoribus, nervis eorum lateralibus pluribus, floribus conspicue pedicellatis, stylis brevioribus haec species sat dissimilis.

Arbor elata, circa 50 m. alta, cum ramulis apice applanatis, griseis, stellato-tomentosis, et gemmis latentibus fulvo-tomentosis. *Stipula* conspicua, oblongo-elliptica, acuta, 1–2 cm. longa, circa 9-nervia, extus tomentosa, intus lepidoto-puberula, diu persistens, dein decidua. *Folia* oblonga vel obovato-oblonga, interdum elliptico-oblonga, 5–9 cm. longa, 2–4 cm. lata, basi abrupte cuneata vel rotundiuscula, apice attenuata, acuta vel subito acuminata, supra glabra, subtus dense tomento-stellata fulvo- vel argenteo-brunnea, utrinsecus 20–25—nervia, petiolis 0.75–1.25 cm. longis eodemmodo stellato-tomentosis stipitata. *Inflorescentia* paniculata, ad 14 cm. usque longa, eodemmodo tomentosa, in ramulis secundariis flores 4–8 congestos producta, cum bracteis bracteolisque pubescentibus, diu persistentibus dein deciduis. *Flores* ante anthesin 3.5 mm. longi, breviter pedicellati, extus argenteo-tomentosi; sepala majora 3, ovato-oblonga, extus tomentosa, intus glabra, altera 2 multo minora, ovata, extus partim tomentosa; petala albescentia, in parte ante anthesin exposita tomentosa excepta, glabra; stamina 15 biseriatim disposita, 5 interiora exterioribus 10 fere duplo altiora, basi dilatata. *Fructus* 5-angulatus, luteo-brunneus; calycis lobi stellato-puberuli, concavi, cum laciniis accrescentibus 3, obovato-lanceolatis, 8–11 cm. longis, 1–2 cm. latis, laciniis alteris 2 excrescentibus, linearibus, 0.8–1.5 cm. longis, ad 2 mm. usque latis. *Nux* ovoideus, in stylopodium conicum attenuatus, minute tomentosus 0.75–1.5 cm. altus.

Borneo: **Brunei**, Batu Apoi (KEP 39,617, paratypus in KEP; KEP 40.471, paratypus in KEP). **North Borneo**: Tawau (KEP 38,838=SAN 4462, holotypus in KEP).

This tall tree has a bole with regular fissures with brown outer bark and purple brown inner one. The leaves are very narrow. The tomentum which varies in colour from grey or silvery grey to yellowish brown is found on the underside of the leaves, branchlets, inflorescence axis, bracts and the flower parts exposed in the buds. Similar to *S. leprosula* Miq., but leaves smaller having more



Shorea argentifolia Sym. (fig. 1–17; KEP 38,838; fig. 18; KEP 39,617; fig. 19: KEP 40,471)

1, Ramulus floriferus. 2, Paniculae fragmentum. 3, Bractea. 4, Alabastrum. 5–9, Sepala. 10, Alabastrum sepalis remotis. 11 & 12, Petala. 13, Flos sepalis desumptis. 14 & 15, Stamina. 16, Flos sepalis, petalis staminibus remotis ut pistillum appareat. 17, Ovarium longitudinaliter discissum. 18, Ramulus fructiferus. 19, Fructus (Amussis cum fig. 1, 18 et 19 tantum congruens; alterae figurae ampliatae).

lateral nerves, flowers more distinctly pedicelled and style shorter. It belongs to the *S. parvifolia* group of the Red Meranti (cf. Symington, Malay For. Rec. 16, 1943, p. 4 & 58–59).

[The drawing was made by Mr. Wong Sze Moy under the direction of Symington whose notes have been also incorporated here. The name has been used in literature as a *nomen nudum* even in A. L. Howard's "A Manual of the Timbers of the World" (1948)].

3. **Shorea superba** Sym. **sp.nov.** (§ Eushorea subsect. *ciliata*)

Inter omnes hujus subsectionis species truncis fere levigatis griseis, basi longitudinaliter paulo-tabularibus; foliis multinervatis, supra griseo rubris, subtus brunneis vel argenteo-griseis, fructibus parvis cum laciniis 3 majoribus et 2 multo minoribus haec species sat distincta.

Arbor elata, circa 60–75 m. alta, cum ramulis apice brunneis, minute stellato-tomentosis. *Stipula* ovato elliptica, mox decidua, roseo-viridis, 1–1.5 cm. longa, 4–5 mm. lata, eodemmodo stellata. *Folia* oblongo-lanceolata, 5–9 cm. longa, 2–3 cm. lata, acuminata vel caudato-acuminata, basi cuneata vel rotundata, supra costis deciduo-tomentosis exceptis glabra, nitida, brunnea, subtus minute stellato-tomentosa, vetustiore fere glabra glaucescentia, utrinsecus 15–25 nervia. *Inflorescentia* in ramulis apicem versus oriens, terminalis axillarisque, axi stellato-tomentosa, in ramulos primarios vel secundarios floriferos divisa, bracteolis deciduis, multinerviis tomentosis praedita. *Flores* per ramulum floriferum 2–8, ante anthesin 2–4 mm. longi, pedicellis brevissimis circa 1 mm. longis suffulti; sepala 3 majora quam altera 2, omnia ovata, apice acuta vel fere, tomentosa; petala linearia, undulata, in alabastro torta, puberula, extus grisea, intus brunnea; stamina 28–32 altitudine variabilia, in appendiculas apice 1–5 ciliatas terminata. *Fructus* breviter stipitatus, laciniis puberulis praeditus, 3 accrescentibus spathuloideis 5–6 cm. longis 1.25 cm. latis, alteris 2, minoribus, angustioribus, linearibus, apice acutis vel obtusis, 3 cm. longis, 3–4 mm. latis. *Nux* ovoideus, sericeo-tomentosus, in stylopodium abrupte angustatus, ad 1.2 cm. longus, 0.75 cm. in diam.

BORNEO: **North Borneo:** Sandakan: Bettotan (KEP 38,853 = Puasa SAN 4,477, holotypus in KEP, isotypi in SAN & SING); Tawao (Elmer 21,714, paratypus in SING).

This species produces relatively smooth, grey bole with irregularly scaling or cracked bark, small buttresses, many nerved

Shorea superba Sym. (fig. 1–14: Holotypus; fig. 15: Elmer 21,714)
1, Ramulus floriferus. 2, Paniculae fragmentum. 3, Alabastrum. 4–8, Sepala. 9–10, Petala. 11–12, Stamina. 13, Flos sepalis, petalis staminibusque desumptis ut pistillum appareat. 14, Ovarium longitudinaliter discissum. 15, Fructus. (Amussis cum fig. 1 et 15 congruens; alterae fig. ampliatae).

leaves which are shining brown above and pale fawn or silvery grey with minute stellate hairs below, silky tomentose flowers and small fruits with minutely pubescent wings.

[The drawing was made by Mr. Wong Sze Moy under the direction of Symington, whose notes have been incorporated here. The species has been listed as *Shorea* sp. 'B' (not to be confused with Symington's *Shorea* sp. "B" of *Malayan Forest Records,* No. 16, 1943, p. 95) in the herbarium of the Forest Research Institute, Kepong.]

4. **Shorea symingtonii** Wood **sp. nov.** (§ Anthoshorea)

A *S. virescente* Parijs, cui affinis haec species differt nervis foliorum lateralibus pluribus, petalis latioribus, fructibus basi valde attenuatis, laciniis eorum longioribus.

Arbor elata, circa 60 m. alta, cum ramulis juventute applanatis, dense fulvo-tomentosis, dein fuscentibus parce tomentosis. *Stipula* 1–1.5 cm. longa, 2–5 mm. lata, tomentosa decidua. *Folia* oblonga vel oblanceolata, 12–16 cm. longa 6–7 cm. lata, obtuso-apiculata vel acuminata, interdum bullatula, basi rotundata vel saepe cordulata, utrinque fulva vel brunnea, supra glabra, subtus secus costas et nervos parce puberula, margine revoluta, utrinsecus 16–24 nervia, petiolis 2 cm. longis, brunneis, minute stellato-tomentosis suffulta. *Inflorescentia* terminalis vel etiam in parte ramuli infra-terminale axillaris, circa 20 cm. longa, laxe multiramosa, deciduo bracteata, florum bracteolis deciduis, puberulis. *Flores* remoti, ante anthesin oblongi vel lanceolati 10–13 mm. longi, 3–4 mm. in diam., pubescentes, fusci, pedicellis ad 5 mm. usque altis, apicem versus crassioribus, concoloribus, pubescentibus suffulti; sepala lineario-lanceolata, coriacea, margine incrassata, leviter cymbiformia, utrinque fusco-pubescentia, inaequalia, tria alteris duobus maiora, omnia conformia; petala oblonga, apice obtusa vel truncata multinervosa, chartacea, in partibus alabastri expositis albotomentosa; stamina 15, per series duas disposita, interiora 5 altiora quam exteriora 10. *Fructus* 5-laciniatus, basi valde angustatus, pedicello 2–3 mm. longo suffultus, interdum glandulosus, laciniis 3 longioribus lineario-oblongis, apice sensim arcuato-acutis, 12–17 cm. longis, 1.6–2 cm. latis; alteris laciniis 2, linearibus, apicem versus angustatis, acutis, 8–10 cm. longis 7–10 mm. latis. *Nux* ovoideus, 2–2.5 cm. longus, minute pubescente rugosus.

Borneo: **North Borneo:** Sandakan, Sepilok (KEP 35.608=SAN 16,522, holotypus in SAN, isotypi in KEP, SING et al; SAN 15481, paratypus in SAN, isoparatypi in KEP, SING, etc.).

Shorea symingtonii Wood (A–C: KEP 35,608; D–H: SAN 15481)

A, Ramulus floriferus. B, Flos. C, Ibid. petalis partim remotis ut dispositio staminum appareat. D, Surculus cum bracteolis. E, Folium. F, Fructus. G & H, Glandula ampliata.

This large tree with shallow fissured and large buttressed bole, has large leaves 12–16 cm. long, 6–7 cm. wide, often cordulate at base, having 16–24 pairs of lateral nerves, the midrib and lateral veins being minutely hairy below; the fruit 5-winged (3 large and 2 shorter ones) narrowed at base, shortly pedicelled. It is an ally of *S. virescens* Parijs, but has more lateral nerves to the leaves, flowers more apart, petals wider, fruits strongly attenuate at base and bearing longer lobes.

[The drawing with fruit was prepared by Miss P. W. Wood at Kew, the one with flowers has been made from the isotype specimen in Singapore by the Singapore artist.]

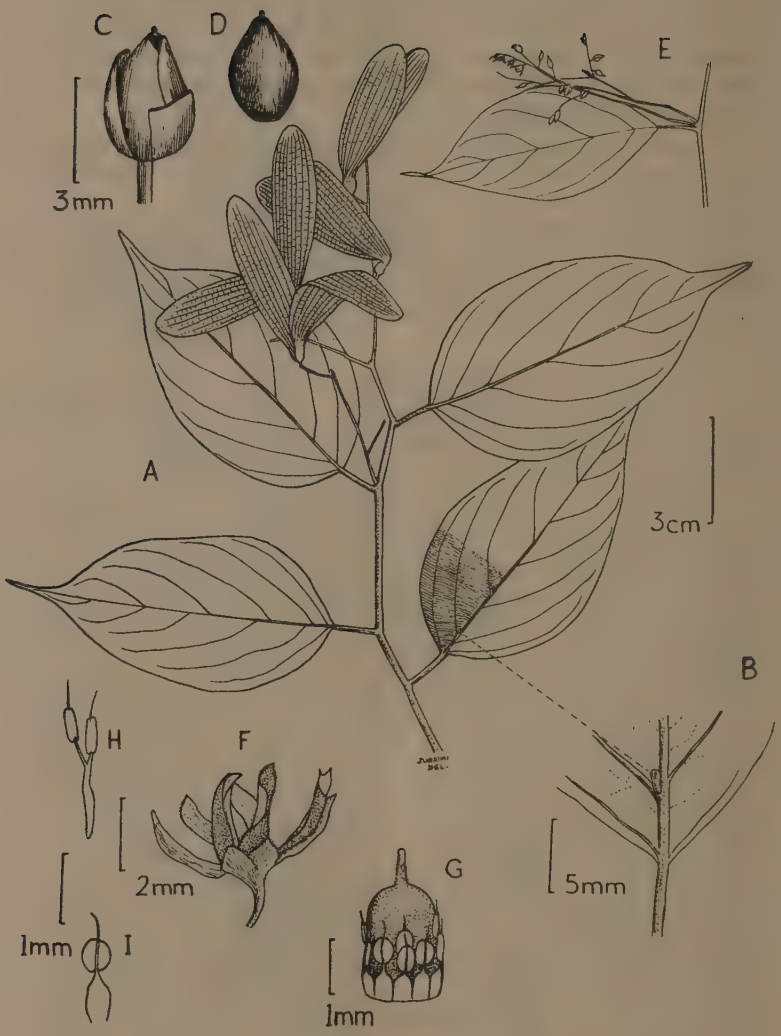
Originally this species was separated as new by Symington but was not named. Some specimens have been distributed as *S. symingtoniana* which is a pre-occupied name. It has been listed as *Shorea* sp. 'L' in the herbarium of the Forest Research Institute, Kepong.

5. **Hopea pentanervia** Sym. ex Wood **sp. nov.** (§ Euhopea)

H. nutanti Ridl. similis, sed foliis minoribus glabrisque, nervis eorum lateralibus paucioribus utrinsecus plerumque 5, floribus minoribus, laciniis fructus angustioribus sat dissimilis.

Arbor circa 30 m. alta. *Folia* ovata vel elliptica, olivaceo-viridia, 6–9.5 cm. longa, 2.5–5 cm. lata, caudato-acuminata, basi paulo oblique rotundata vel breviter cuneata, utrinque glabra, supra nitida, utrinsecus nervis lateralibus 4–7 plerumque 5, porrectis subtus prominenter, supra dibiliter percursa, petiolis circa 1–1.3 cm. longis stipitata. *Inflorescentia* axillaris, solitaria vel interdum binaria, in ramos secundarios floriferos ad 1.5 cm. usque longos divisa, bracteis deciduis, axi omnino glabra. *Flores* in alabastro ovoidei, cum pedicellis 4 mm. altis circa 2 cm. longi; sepala utrinque glabra, 2 majora petalis paulo longiora, lingulata, externe longitudinaliter reflexa, olivaceo-brunnea, altera 3 minora ovata vel fere orbicularia, albescentia, margine fimbriata; petala linearia, apicem versus paulo angustata, obtusa, margine fimbriata, extus albo-tomentosa, intus fere glabra vel minute puberula, flavescentia; stamina 15, per series 2 disposita, inaequalia. *Fructus* bi-laciniatus, omnino glaber, fusco-brunneus, pedicello 1.5–2 mm. longo stipitatus; laciniis majoribus 2 spathulatis, 4.5–5.5 cm. longis, 1 cm. latis; minoribus 3, circa 5 mm. longis, quam nux cum stylopodio brevioribus. *Nux* ovato-conicalis, breviter apiculatus, 6 mm. longus, 2.5 mm. in diam.

Borneo: **Sarawak,** Baram (SAR 1257, holotypus in KEP, isoholotypus in SAR). **North Borneo,** Bongawan—Paper (Mail, SAN A. 1753, paratypus in SAN, isoparatypus in KEP & SING).



Hopea pentanervia Wood (A–D: A–1753 in SING; E–I: SAR 1257 in KEP)

A, Ramulus fructiferus. B, Folii fragmentum cum glandula (ampliatum). C, Fructus. D, Nux. E, Ramulus floriferus. F, Flos. G, Ovarium cum staminibus. H & I: Stamina.

The leaves are glabrous, provided usually with 5 pairs of nerves and often with domatial glands in the axils of basal nerves. Bole often fluted, somewhat cracked and flaking. The species is similar to *H. nutans* Ridl., but differs in smaller glabrous leaves having fewer lateral nerves, smaller flowers, and in the fruit wings being narrow.

[The drawing is made by the artist of the Botanic Gardens, Singapore, from the specimens in Kepong Herbarium.]

G. H. S. Wood, M. A., F. L. S.

(A tribute)

[*Footnote:*—Mr. G. H. S. Wood died on 6th May, 1957 in the Kuala Belait hospital, Brunei State, as a result of burns received in an accident at his camp. A short obituary notice will be found in the *Malayan Forester* Vol. XX, p. 121. The following account of his last collecting trip was written shortly after his death. Apart from his numerous collections he left some work nearly ready for publication, including field notes on all and completed descriptions of two of the new species published in this number. His contribution to the botany of Borneo was far greater than his published work can ever indicate, and it is fitting that it should not be forgotten.

Since then Mr. P. S. Ashton has been collecting continuously in the forests of Brunei until his departure in February 1960, and Dr. W. Meijer in 1959 joined the Forest Department in North Borneo as successor to Mr. Wood. Thus the work of botanical collecting, which Wood did so much to further, is being faithfully carried on after his departure.

B.E.S.]

"For Lycidas is dead, dead ere his prime
Young Lycidas, and hath not left his peer."

In 1957 the late Geoffrey Wood, then Forest Botanist, North Borneo, had only recently returned from his first long leave in England (where I had visited him working in the Kew Herbarium). He wished to widen his field knowledge of North Borneo trees by studying them in their Brunei habitat, and a tour was arranged for that purpose. Peter Ashton, Forest Botanist, Brunei, (with whom Geoffrey travelled out in the *Canton*) and myself were privileged to be with him almost continuously for what were destined to be the last few weeks of his life. You cannot, for long, live under the same tarpaulin or share the same longhouse verandah with a man without obtaining a clear idea of his character and qualities; this brief tribute is an attempt to give some idea of how he lived and worked and appeared to us during these last days.

He arrived in Brunei on 13th March, bringing with him three of the North Borneo forest staff. Two of these, Kapis and Kalukut by name, were Dusuns from the upper reaches of the Kinabatangan River; the third was a Christian forest guard from Jesselton. The two Dusuns were expert tree climbers; given time they could climb any tree, by building a bamboo ladder up it if necessary. Kapis, the elder man, was frequently and proudly referred to by Geoffrey as the finest jungle man in North Borneo and it was an exceedingly

odd tree if neither Kapis, with his partly inherited and partly self-taught native jungle lore, nor Geoffrey, with his patiently acquired scientific knowledge, could "place" it.

The Dusuns were the most taciturn and inscrutable of men; they hardly ever spoke, except in Dusun amongst themselves, and it was impossible to guess most of the time what was in their minds. Yet Geoffrey had won their confidence and their loyalty in a remarkable way. He used to work very long hours, out in the forest from 7 a.m. to 3 p.m., often 4 p.m., sometimes 5 or even 6 p.m.; a short break on return to camp; and then the laborious work of trimming and putting away the day's collections, usually three to four hours' work ending up by the light of the battered old Tilley lamp that he carried. Yet they never groused or complained. As a party they were perhaps the most efficient collecting unit the forests of Borneo had seen up till then. Not since the days of Beccari, nearly a century ago, had any botanist collected the trees month after month over a period of years, as Geoffrey did. And when it was all over, perhaps the most moving moment in the funeral service was when these two Dusuns came forward to the graveside, side by side, to sprinkle earth on the coffin.

Sporadic collecting had been done over the past 23 years in Brunei by successive State Forest Officers and by the forest staff, but only twice before had a qualified botanist toured in Brunei. The late C. F. Symington came over from Malaya for two weeks in 1938, and Mr. J. Wyatt-Smith spent a week here during his visit to Borneo in 1954. This previous work had given us a general picture of the Brunei forests. The plan for Geoffrey's strong party was intensive collecting at a number of localities known to be of special interest.

The first month was spent in the Temburong district, with camps at Kuala Belalong (submontane country in the upper Temburong), Bangar (exploring the Biang ridge), Labu Estate (Bukit Patoi and Bukit Peradayan and Labu swamp forest). The second month (interrupted by Easter week, during which Geoffrey sailed for Sandakan at the Kuala Belait interport regatta) was spent in the *Shorea albida* forests behind Seria, and in the Andulau Forest Reserve. Priority was given to the Dipterocarps, of which many interesting collections (mostly sterile) were made, but trees of other species were collected if in flower or fruit. The collections amount to some hundreds of species, which will take a long time to classify and name. Several Dipterocarps new to Brunei (and to science ?) were obtained, and by running through the sheets in the Brunei herbarium Geoffrey was able to clear up a number of puzzles.

The fates were against him on this trip. On the day we left Brunei to start the tour his ankle swelled up alarmingly and turned blue—delayed reaction from a blow from a hockey stick in a game just before he left Sandakan. For over a week he could only hobble a few steps, and had to confine his collecting to what he could see from a dug-out. In botanically virgin country this must have been terribly disappointing, but he never complained, and derived some satisfaction from poring over the collections Peter and I brought back daily from the surrounding ridges; his presence in camp was invaluable, because his knowledge enabled him to direct our efforts to best advantage. Any kind of dead leaf that looked as if it might be a dipterocarp was picked up and brought in. Geoffrey could tell infallibly (*a*) if it was a dipterocarp or not; (*b*) if it was, to which group it belonged, and whether it was worth collecting or not. Rest and hot fomentations eventually reduced the swelling, and for the last day or two at that camp he was able to climb the hills. For the rest of that month in Temburong district the fates relented, and he was on top of his form; but during the sailing regatta he contracted a chill, and was troubled with a severe cold and fever during the last week in the Andulau Forest Reserve.

Looking back over those two months, what impressions remain? First, I think, must come his intense interest in his work, and his already deep and extensive knowledge of Bornean plants. He was extremely conscientious and thorough; however hot the day, however trying the leeches, painted flies, mosquitoes, sandflies, or other pests, he resisted the temptation to scamp the work, and the notes written on each collection were always full and detailed. This attribute alone marked him out as a great field collector, in the tradition of Beccari and Symington.

Next, perhaps comes his endless patience. His Dusun climbers were sure but often slow, yet never did he betray the slightest impatience with them, but was wont to jolly them along with cheerful cries and imitations of the Helmeted Hornbill's weird notes. How inappropriate therefore that the fates should have exacted so severe a penalty for a moment's impatience with a refractory camp fire.

Never again shall we see him, clad in jungle green, gazing up at the tree-tops in search of fertile material, with the binoculars he always carried—sometimes standing, but as often as not lying flat on his back on the leechy forest floor. Never again shall we see him sitting on the ground, puffing away at his pipe, writing those endless notes in his field book on some specimen which his climbers were busy collecting. On a long trip such as this he let

his beard grow, I suspect chiefly because the few minutes saved by not shaving every day could be devoted to writing some extra notes. Never again shall we see him snipping away with a large pair of clippers, as he used to do hour after hour trimming his material to give at least a dozen specimens; for he collected not only for Sandakan Herbarium but for the great herbaria of the world, Singapore, Kepong, Kew, Leiden, Arnold Arboretum, and the rest, to which duplicates were distributed.

It is difficult to write of his other interests; chiefly because we were so enveloped and caught up by his enthusiasm on this trip, and usually so tired out by the time the last specimen was put to bed, that I cannot remember any subject other than botany being discussed at length. We shared a common interest in mountains (when in England he had asked me to propose him for membership of the Himalayan Club) and sometimes talked of the Cuillins, or the Himalayas, or the Silvretta. He was interested in photography and carried two cameras, one for monochrome and one for colour, but these were chiefly used to picture the barks of trees or colourful figs.

"Lycidas is dead, dead ere his prime." Had he been spared and devoted enough years to the work he might have become a great botanist; but he was cut off when he was only just beginning to tackle taxonomic work and describe new species. I have already suggested that he was a great collector, and he had the luck to be in the field during 1955, one of the great dipterocarp flowering and fruiting years, when he obtained many species in flower or fruit for the first time in botanical history; the magnificent material he collected and distributed round the world will be his memorial. According to Milton,

> "Fame is the spur that the clear spirit doth raise
> To scorn delights and live laborious days."

I doubt whether botanist explorers follow their arduous calling in the hope of achieving fame so much as from sheer curiosity and love of travel. However Geoffrey might have answered the question we do not know, for he has now joined the select few, including George Forrest and Reginald Farrer, who died in harness, or (in the words inscribed on Farrer's lonely tombstone in far Northern Burma), who "died for love of beauty, and in search of rare plants."

B.E.S.

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